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J. B. Madden

PRESTWICH'S DISSERTATION

ON

MINERAL, ANIMAL, & VEGETABLE,

POISONS;

Containing a Description of Poisons in
General, their manner of Action, Effects
on the Human Body,

AND

RESPECTIVE ANTIDOTES;

With

Experiments and Remarks on Noxious
Exhalations from Earth, Air and Water.



Together with Several Extraordinary Cases,

AND
Elegant Engravings of the principal Poisons
of the Different Countries

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1775.



RIGHT HONOURABLE

THOMAS DUCIE MORETON

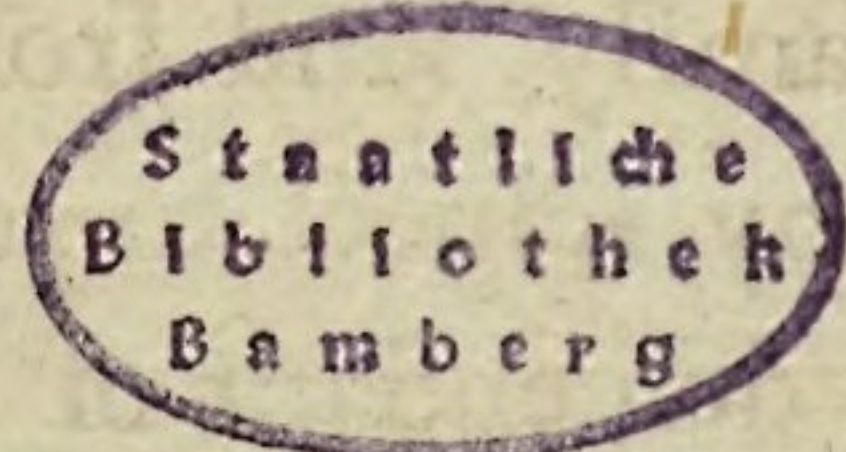
LORD DUCIE of FORTWORTH

In the County of Gloucestershire, &c.

My Lord,

I have the pleasure of receiving
your letter of the 10th inst. in relation to the
proposed alterations in the Statute relating to the
rights of the Poor, &c. &c. &c.

I am, Sir, very respectfully,
Your obedient servant,



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your letter of the 10th inst. in relation to the
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Your obedient servant,
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proposed alterations in the Statute relating to the
rights of the Poor, &c. &c. &c.
I am, Sir, very respectfully,
Your obedient servant,

TO THE
RIGHT HONOURABLE
THOMAS DUCIE MORETON,
LORD DUCIE OF TORTWORTH,

In the County of GLOUCESTER, &c.

MY LORD,

THE liberty I have taken of prefixing your Lordship's name to this Work, proceeds wholly from the veneration I bear to your noble family, and from the desire I have to testify my respect to your Lordship, the honourable descendant of it.

My design in collecting and digesting this short Treatise upon Poisons, which now solicits your Lordship's Patronage, was to put a check to the fatal effects of a disease, the most terrifying to human nature. If my endeavours should be attended with success, there is reason to hope, from your acknowledged candour, that I may be permitted to boast, in common with other benefactors to mankind, your Lordship's sanction, which, should I be fortunate enough
to

DEDICATION.

to obtain, I shall esteem it as one of the happiest events of my whole life.

STRANGER as I am to the language of dedications, it would ill become me to attempt a display of those eminent qualities which add lustre to your Lordship's elevated rank. Happy in the enjoyment of the public favour, may you long continue to reap the fruits of that self approbation, which yields the truest satisfaction to a great and a liberal mind.

I am,

MY LORD,

YOUR LORDSHIP'S

Most obedient,

Humble Servant,

London,
1775.

JOHN PRESTWICH.

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A
T R E A T I S E
O N
P O I S O N S.

INTRODUCTION.

THOSE things, which are experienced to be in their whole nature, or in their most remarkable properties, so contrary to the animal life, as in a small quantity to prove destructive to it, are called Poisons : whether they are hurtful by being taken inwardly at the mouth, or communicated to the body externally by a wound.

“ God made not death, neither hath he
“ pleasure in the destruction of the living,
“ For he created all things, that they
“ might have their being ; and the genera-
B “ tions

“ tions of the world were healthful ; and
 “ there is no Poison of destruction in
 “ them, nor the kingdom of death upon
 “ the earth,” *Wisdom of Solomon*, cap. i.
 v. 13. As to this text, the meaning of it
 is plainly this. “ God created nothing to
 “ be destructive to mankind, but gave to
 “ all things their proper nature ; and the
 “ productions of the world are wholesome.
 “ Even poisons were not designed to be
 “ hurtful, but for good uses ; for in all the
 “ earth there are provisions made against
 “ death.”

The true state of the case seems to be
 this. The productions of nature of this
 kind, as to us, are often medicinal, either
 in the external or internal use of them ;
 and experience, improved by reasoning,
 teaches us to prepare and apply them to
 various purposes : but they are also not only
 physic, but even food to some other ani-
 mals, which, by natural instinct, devour
 them ; and these themselves afford not only
 good

good nourishment, but sometimes remedies to us. Little insects, which we think troublesome, are necessary to the life of wholesome birds and other creatures.

Goats and quails are fattened by Hellebore, starlings by Hemlock, and hogs innocently eat Henbane; all which we call poisonous—But this question may, perhaps, seem more difficult with regard to poisonous minerals: as for instance, Arsenic, which we find to be diffused almost through the whole mineral kingdom.

Now it must be observed, that this is not a perfect mineral, but an active substance, made use of by nature in preparing several metals in the earth, which are of great service to man. It particularly appears to be so in the growth of silver, copper, tin, and lead; the ores of all which contain, besides common sulphur, a great deal of arsenic; so that this, in the language of the chemists, may be called a mineralising principle; and the case

4 INTRODUCTION.

will be found to be much the same in all natural productions of this kind.

Before we proceed to particulars, it may not be improper to give a general idea of poisons, to explain in what manner they act, and by what alterations made in our bodies they become so hurtful.

Now as to this, it will appear from what follows, that the poisons are of different kinds, as well those which kill by wounds, as those which are taken inwardly; yet there is a great agreement in the manner of producing their effects: and that even *internal* poisons exert their force in a manner analogous to the external.

Venomous animals, when they bite or sting, inflict a wound, and instil into it a drop or more of liquor, which infects the fluid of the nerves, and by this means inflames the membranes: hereupon a swelling arises, sometimes to a degree of mortification, which spreads to the neighbouring parts.

Poisonous

Poisonous substances, being swallowed, wound the nervous coat of the stomach. An inflammation ensues, which, according as the Poison is of a greater or lesser power, is communicated to the contiguous coats; and, in some cases, especially if it be of a mineral nature, ends in a perfect gangrene. For the difference between mineral and vegetable poisons lies chiefly in this, that the former are of greater force than the latter.

But in all accidents of this kind, whether the wound be outward or inward, the mischief does not stop at the part affected, but it is carried farther, even through the whole body.

This is effected by the great activity of the nervous fluid, one part of which being infected, immediately *taints* all the rest: and thus the whole system of nervous expansions is drawn into spasms and convulsions; which, according to the dif-

6 INTRODUCTION.

ferent offices of the parts to which the nerves belong, produce different symptoms.

In the stomach and intestines these spasms cause sickness, vomitings, and gripes; in the brain, deliria, sleepiness, and epileptic fits; in the heart, intermissions of the arterial pulse, palpitations, and swoonings; in the lungs, difficulty of breathing, with strangling and suffocations; in the liver, by the spasmodic contraction of the biliary ducts, the bile is returned into the blood, and causes a jaundice; in the kidneys, the same disposition of the urinary canals interrupts the secretion of urine, and makes it quite irregular. In short, the animal œconomy is all disturbed; and though different poisons may shew their most remarkable effects in different parts, and these, according to the violence of the hurt, may appear in very different degrees; yet the symptoms always make it plain, that the first bad impression is made upon the animal spirits.

Thus

Thus the first symptoms with which persons are seized in pestilential fevers, being faintness, giddiness, palpitations of the heart, tremblings, &c. prove the nervous fluid is likewise principally affected in these diseases; contagion being indeed a real poison, &c.

The cause of the Plague, is of such a nature, that when taken into the body, it works such changes in the blood and juices, as to produce this disease, by suddenly giving some parts of the humours such corrosive qualities, that they either excite inward inflammations and gangrenes, or push out carbuncles and buboes; the matter of which, when suppurated, communicates the like disease to others.

OF THE
NERVOUS FLUID,
OR
ANIMAL SPIRITS.

AS the brain is manifestly a large gland, with a most exquisite apparatus for the separation of a liquor from the blood; this must, like all other glands, have an excretory duct: now the nerves are evidently contrived for this purpose, and consequently must always contain a proper subtile juice. Therefore this fluid, so far as we can discover by its effects, is a thin volatile liquor, of great force and elasticity; being indeed, most probably, a quantity of the universal elastic matter, incorporated with the finest parts of the blood, separated in the brain, and lodged in the fibres of the nerves. This is the instrument of muscular motion and sensation, a great agent in secretions, and indeed in the whole business of the animal œconomy.

By

By the universal elastic matter we may understand, that subtile and active substance, diffused throughout the universe, which Sir Isaac Newton supposes to be the cause of the refraction and reflection of the rays of light, and by the vibrations of which light communicates heat to bodies; and which readily pervading all bodies, produces many of their actions upon one another.

It seems very reasonable, from that uniformity, which there is in the laws of nature, to conclude, that the animal spirits are something of this kind: for there can be no greater presumption in favour of a scheme, than that it is simple; and of a piece with the known system of the universe.

Now, an active substance of this kind in the nerves, must necessarily be very susceptible of alterations from other bodies of extreme minuteness and great force: in like manner, as we see some chemical liquors,
upon

upon their first approach to each other, to fall into fermentation ; the result of which is a compound mixture of a quite different nature, from what might have been expected from the single ingredients.

Thus the compound spirit of nitre put to oil of cloves will effervesce even to a flame : a fermentation being indeed no more than the attraction and repulsion of the particles of different bodies, when they come together.

By reflecting upon the phænomena, which the experiments of late years made upon electricity, have discovered to the world, and viewing the attraction and repulsion of the finest particles of electrical substances, any one may easily form an idea of this animal fluid, and of the excessive force and velocity with which it acts.

It is very observable, that the communication of electricity is much greater through animal, than through inanimate bodies ; that is, the elastic fluid passing through
these,

these, meets with a greater quantity of the same matter in them than in the other: the solid animal fibres being more adapted to receive it.

The nervous fluid is endowed with great activity and force, and therefore capable of receiving various alterations from other bodies, especially such as consist likewise of very subtile and powerful particles; and all poisons we know are of this kind.

The effects of poisons, especially those from venomous animals, are entirely nervous; for the suddenness of their mischief is so quick on the animal spirits, that the bite of a rattle snake has killed a dog in less than a quarter of a minute.

As the different state of the nervous fluid may, in some measure, alter their effects; so likewise these poisons themselves, though really of the same kind, may yet so differ in their force and degree of action, as to be hurtful in various and seemingly different ways.

It

It must be observed likewise, that although the first impression of the poison be made upon the nervous spirit, yet the whole mass of blood very quickly partakes of the hurt; not, as is supposed, from any mixture of the venom with it, but from such a corruption of it, as an irregular circulation, interrupted secretions, and stagnations in the smallest vessels, (the consequences of a vitiated nervous fluid) may naturally produce. Nor will this seem strange, since such a compounded liquor, as the blood is, may certainly undergo any imaginable changes by alterations made in its motion only. Thus much concerning the general action of poisons: in the following pages, I shall shew the particular actions of them, and afterwards the effects of the particular kinds of them.

O F
F E R M E N T A T I O N ;

T H E

MEANS BY WHICH IT ACTS UPON THE
NERVOUS FLUID, AND THEREBY UPON
THE WHOLE FRAME.

NOW, as we every day observe, that
what is thrown out from liquors in
a ferment, is capable of inducing the like
motion in another liquor of the same kind,
when duly mixed with it ; so we may very
well suppose, in the present case, that the
saliva of a mad dog, which is itself one
of the most fermentative juices in nature,
being turgid with fiery saline particles,
thrown into it out of the boiling blood,
when it comes by means of a wound to be
mixed with the nervous liquor in another
animal, must necessarily put it into violent
agitations, in the nature of a ferment,
the consequence of which will be all the
effects

14 EFFECTS OF FERMENTATION.

effects of an interrupted secretion in the brain, and disturbed circulation of the blood, viz. a fever, delirium, convulsions, &c.

The blood in this case is putrified in an extraordinary degree, and the inflammation runs so high, that it burns the skin; so that the pestilent humours are bred in it, and quite consume it.

The smoke of sulphur, which by experience is found to abound with an acid spirit, and very penetrating, has also a powerful property in repressing fermentations, and may promise some service in the case of the plague, &c.

OF

O F
P O I S O N S.

BY the word Poison, in medicine, is understood a malignant quality in some vegetable or mineral body, which renders it hurtful, and even mortal to those who take it. There are three essential marks of poisons, which distinguish them from other things that are noxious to human bodies. The first is, that they consist of most subtile parts, and are consequently pernicious in a small quantity. The second, that they in a short time prevent the regular motions of the solids and fluids throughout the body, and induce the most grievous symptoms, and even death itself; and the third, that they exercise their cruelty on the most subtile fluids, and the most nervous parts.

Poisons are of various kinds, and operate in various manners; some by dissolving
ing

ing the blood, others by coagulating it; and others by corroding, and destroying the solid parts. All the three kingdoms have poisons peculiar to themselves; but the animal kingdom affords the most subtle, which are communicated by the bite of mad or venomous beasts, when they are angered. The mineral kingdom produces arsenicals and mercurials; and the vegetable, *herbs* and plants of a most acrid, noxious and deleterious quality, such as the most violent cathartics and narcotics. Some things will kill in a short time which are not poisons; as cold water drank plentifully when the person is in a profuse sweat; severe cold; a large quantity of brandy, or other spirituous liquors; and mineral spirits, as oil of vitriol.

Every sort of poison seems to have an effect peculiar to itself; thus mercury attacks the fauces and their glands, producing ulcerations therein; arsenic occasions the most cruel torments, convulsions, mortifications

tification of the coats of the intestines: Litharge, unwarily taken, causes a convulsive cholic, with an obstinate costiveness: *Milk*, mixed with *oil*, is an excellent remedy against all corrosive poisons. Hoffman says, that he once prevented the death of ten young persons, who had taken among them almost two ounces of arsenic in water-gruel, which, in a short time, produced the highest anxieties, and corroding tortures, by *oil* of sweet *almonds* and *milk*. They took at least ten quarts a-piece, which they vomited up again before the reaching to vomit ceased. The same author also affirms, that *milk*, in a large quantity, is an universal remedy against all poisons that kill by inflammation, as Hemlock does; and, if taken in time, will prevent their dreadful consequences*. Of the vegetable kingdom, are the seeds of *Datura*, a kind of stramonium, which in-

* Vide Allen's opinion, folio.

duce madness or absolute stupidity. Opium brings on sleepiness, and a torpor on the mind: the berries of deadly nightshade, as also the roots of the *cicuta-terrestris*, produce madness, rage, or folly. Hyoscyamus causes a stupor, and so troubles the imagination, that the person affected believes he sees dæmons and spectres: sharp drastic purges inflame the intestines. Of the animal kingdom, are the *bite* of a mad dog, which occasions the dread of water: the venom induced by the sting of a *tarantula*, produces wonderful effects; for the patient is delighted with musical instruments, and when he hears their sounds, immediately begins to dance; the sting of a scorpion produces a sudden chillness and exceeding cold sweats.

M I N E.

MINERAL POISONS

A R E,

COBALT, a singular
species of arsenical
ore.

ARSENIC, white,
yellow, and red.

ORPIMENT.

QUICKSILVER, dis-
solved in acid mi-
neral spirits.

MERCURIALS.

CORROSIVE SUBLI-
MATE.

COPPER FILINGS
dissolved in Vine-
gar.

AQUA FORTIS.

VAPOURS of Mine-
ral Spirits.

WHITE VITRIOL.

LEAD.

LITHARGE.

CERUSSA, or white
Lead.

WHITE LEAD dis-
solved in Vinegar.

GLASS of Anti-
mony reduced in-
to powder, &c.

FUMES of LEAD.

--of ARSENICAL and
MERCURIAL Mi-
nerals.

MINERAL SPIRITS.

Oil of VITRIOL, &c.

SMALT.

The mineral kingdom furnishes very few real poisons ; the only natural one is cobalt : the factitious are, arsenic, corrosive sublimate, and glass of antimony ; the true orpiment is neither a yellow arsenic, nor a poison, it being void of all deleterious qualities ; neither has it any drastic qualities, either as a cathartic, or an emetic. Quicksilver, dissolved in acid mineral spirits, is likewise a poison ; though of itself it is entirely innocent ; likewise glass of antimony, reduced into powder and exhibited, causes violent vomitings, with most cruel gripings, which often end in death, sometimes in a few hours.

Arsenic taken inwardly creates a pricking, and burning sensation, with a heat and violent pain in the stomach, a racking torture in the bowels, vomiting, unquenchable thirst, a roughness and dryness of the tongue, fauces, and gullet, with hiccoughs, then follow most cruel anxieties, palpitation of the heart, faintings, and a coldness of
the

the extremities ; sometimes *black vomiting* and stools, with a foetid, cadaverous smell ; and a gangrene of the stomach and intestines, which usher in death, if not timely prevented.

In all cases where a person is suspected to have been poisoned by swallowing any substance of a corrosive nature, give, as soon as possible, large quantities of oil and milk mixed, quart after quart, till the reaching to vomit entirely ceases, and the patient gets ease.

Quere ; in the royal navy, when milk cannot be procured, would not the *common* almond emulsion, or a decoction of marshmallow root, be a proper succedaneum, if at hand ?

O F

C O B A L T.

COBALT (a singular species of arsenical ore) is a kind of marcasite, which is found in great plenty in the mines of Misnia; and is well known for its poisonous quality, so fatal to insects, brutes, and men.

In making the blue glass, or enamel, called Smalt, from this mineral, a sort of white flowers arise, which being melted in a stronger fire, obtain the name of White Arsenic. If this be melted again with an additional eleventh part of sulphur, it becomes yellow arsenic; and with a further sixth part of sulphur, red arsenic; of these the white is the most deadly poison.

O F

O F

A R S E N I C.

ARSENIC is a ponderous mineral substance, volatile, and inflammable, which gives a whiteness to metals in fusion, and proves a violent corrosive poison. Arsenic is a most violent poison to all animals; unless the wolf should be an exception, who is said, probably without foundation, to be only purged by it. With regard to the effects of arsenic in the human body; a nausea, sickness, and reaching commonly ensue in half an hour after taking it, followed by violent vomitings, hiccups, and pains in the stomach and bowels; convulsions and palsies of the limbs presently succeed, with intense heats, cold sweats, palpitations of the heart, extreme anxiety, restlessness, prostration of strength, thirst, and dryness of the mouth and throat, loss

of reason, and at last death. If the quantity taken has been considerable, the stomach and intestines are often found, upon dissection, corroded or perforated; though in general the patient expires before the action of the poison has proceeded to such a length. There are many poisons which act by coagulating the juices; but the operation of arsenic is erroneously supposed to be of this kind; arsenic rather liquifies, than coagulates the blood, and makes no change in its colour: it rather prevents than promotes the coagulation of milk, saliva, and other animal juices. It is better to acknowledge our ignorance, than to advance groundless conjectures.

Several substances have been proposed as antidotes to this poison. If rock crystal, bezoar, or the *roots* of the elder tree, by some strongly recommended, have seemed to do service where arsenic had been taken; it was not on these ingredients, but on the
oils

oils or fats used along with them, that the good effects depended.

THE ONLY ANTIDOTES.

Oils, fats, warm fat broths, fresh butter, and milk, taken plentifully and repeatedly, are the only antidotes, both for obtunding the force of the arsenic, and promoting its discharge by vomit. If the vomiting does not freely succeed by the liberal use of these kinds of substances, some mild emetic must be added; the expulsion of the poison being a principal point. The more threatening symptoms being thus removed, oily clysters, and a gentle laxative, are necessary to obtund and evacuate such part of the arsenic as may have passed into the intestines; after which the strength is to be recruited by proper analeptics (such medicines as are proper for nourishing the body when weakened). Cases frequently happen, in which gentlemen of the faculty are called upon to determine,

termine whether a particular substance be arsenic or not; as when powdery matters are found in the stomach of a person suspected to have died by poison. Arsenic, in a solid form, may be distinguished by its yielding in the fire, white fumes and a garlicky smell, and by its whitening copper. This last trial is most commodiously made, by placing a little of the powder betwixt two clear polished copper plates, binding the plates firmly together with wire, closing the juncture all round with a good lute, and then heating them red-hot. We may try also, whether any reguline or semi-metallic matter is obtainable, by means of tartar and fuel. White arsenic, or arsenic strictly so called, is a moderately heavy, compact, hard, brittle concrete; of a crystalline or vitreous appearance, gradually changing, from exposure to the air, to a milky hue, like that of porcelain; and at length to the opake whiteness of enamel. The large masses preserve their transparency longer than

than the small; in a dry, longer than in a moist air. In the fire, it neither burns nor perfectly melts; but totally and readily exhales in thick fumes, of a strong fetid smell, resembling that of garlick. The fumes, caught in proper vessels, condense, either into crystalline masses again, or into a white powder, according as the receiver is more or less removed from the eath.

White arsenic has a milky whiteness, is gritty and insipid; it swims on the surface of cold water like a pale sulphureous film, but the greatest part sinks to the bottom, and remains there undissolved. If thrown on a red hot iron, it does not flame, but rises intirely in thick white fumes, which have the stench of garlick, and cover cold iron, held just over them, with white flowers. Ten grains boiled in a gill of clear water, and then passed thro' a filter, I divided into five equal parts, and put into as many glasses— Into one I poured a few drops of spirits of salt armoniac; into another some of the
lixivium

lixivium of tartar ; into a third, strong *spirit* of vitriol ; into the fourth, some *spirit* of salt ; and into the fifth, a little syrup of violets. The first threw down a few particles of pale sediment ; the second gave a white cloud, which hung a little above the middle of the glass ; the third and fourth made a considerable precipitation of a lightish coloured substance, which in the former hardened into glittering crystals, sticking to the sides and bottom of the glass. The syrup of violets produced a beautiful pale tincture, &c. A mortification of the pudenda is peculiar to the poison of arsenic.

Yellow Arsenic is prepared by subliming white arsenic, with the addition of a tenth part of sulphur. This is not so transparent as the white, but splendid, and very like to a metallic yellow glaze.

Red Arsenic differs from the yellow only in this, that a greater quantity of sulphur is added, together with a particular kind of a red cobalt, called Kupfer Nickel.

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ORPIMENT.

THE arsenic of the Greeks, *Αρσενικόν* or *Αρρενικόν*, was what the Latins named Auripigmentum, and we call Orpiment.

This is found in Greece and Hungary, in particular mines and veins, and is never mixed with any other mineral. It is of a foliaceous or laminated texture, and contains a great deal of sulphur, as appears by its inflammability, and by its affording, when mixt with mercury sublimite, a true cinnabar. By simple fusion it runs into a mass of a cinnabarine colour, called Sandarach. Then it yields a regulus, in every respect like to the regulus of true arsenic, yet it does not act as a strong poison. Hoffman gave a good quantity of it to a dog, without its doing any harm. The reason of this
is,

is, because its metallic particles are combined with sulphur, and not with salt, at least in any considerable degree.

All mineral poisons bear some analogy to arsenic, and are more or less dangerous, according as their salts receive more or less force from the metallic particles. For this reason, as we have observed, that the most virulent may be mitigated by breaking the points of the saline crystals; so on the other hand, the most innocent minerals may become corrosive, by combining them with salts; as we see in the several preparations of silver, antimony, iron, &c.

This put Mead in mind of making a remark, which is both curious and useful. It is observed, that the fumes of lead are very noxious to those who are constantly employed in melting it, as plumbers, casters of shot, &c. It is found by experience, that this inconvenience did not attend the melting new lead, in any degree so much as it did the melting it when it was old;
for

for it is observable, that the workers in casting new metal have never suffered in their health by it. This difference is ascribed to the corrosive quality which lead acquires from the salts in the air, by lying long exposed thereto.

For the fumes of minerals are only parts of the respective substances minutely divided ; and therefore will not only produce suitable effects, but also in a more dangerous way ; being not so much guarded against, and yet admitted farther into the body, that is, into the lungs, in respiration, as well as into the stomach, by means of the saliva ; not to mention the impression upon the spirits in the nostrils, which must certainly be very considerable.

Mead mentions his having a clear liquor, which, though ponderous, was so volatile, that it would all fly away in the open air, without being heated ; and so corrosive, that a glass stopper of the bottle, which contained it, was in a short time so eroded,
that

that it could never be taken out. The fume from it was so thin, that if a candle was set at some distance from the bottle, upon a table, the heat would direct its course that way ; so that it might be poisonous to any one that sat near to the light, and to nobody besides. It is sufficient to the purpose to observe, that it was salt combined with metallic bodies.

M E R-

O F
M E R C U R Y,
O R
Q U I C K S I L V E R.

MERCURY, or Quicksilver, dissolves in all mineral acids, but with different degrees of facility; and proves a menstruum for sundry metallic bodies.

Quicksilver, considered as a medicine, is a specific against the *venereal disease*, *worms*, *lice*, and all kinds of *insects*; the venereal distemper is not, perhaps, to be radically cured without it; but against insects there are other remedies equally, if not more effectual. It has been commonly supposed to have of itself no poisonous quality; but it appears, from experience, manifestly prejudicial to the nerves and the bones. Its ill effects are most observable,

able, in those who are exposed to its *fumes*; which fumes are no other than perfect quicksilver, as any one may be convinced, by receiving them on a piece of moist leather or cloth; upon which they will reunite into little globules of mercury. Most people admit a pernicious quality in the fumes, tho' they deny it to exist in the quicksilver, not considering that the fumes are only the quicksilver itself, divided, but not altered by the heat. Even mercurial ointments, applied externally, have occasioned contractions of the limbs, corrosions of the bones, and other dangerous consequences. How soon do the miners feel its ill effects, though they are neither anointed with it, nor swallow it, nor are exposed to the fumes into which it is resolved by fire! They first become paralytic, and fall afterwards ~~into~~ a salivation: their teeth drop out; violent pains are felt in the whole body, particularly in the bones, and at length death ensues. The Spanish physicians treat such patients

patients in this manner ; they expose them frequently for a considerable length of time to the open air, and give internally nothing but absorbents.

Calomel seems to be the best and safest of the mercurial preparations that can be taken in a solid form. It may be given from five, to ten, or even twelve grains, in very robust constitutions ; or, as an alterative, from one, to two or three grains.

Dr. Saunders asserts, that mercurial preparations are prevented from affecting the salivary glands, by the constant use of a solution of gum arabic in barley water, made in the following manner, viz. two ounces of gum arabic to a quart of barley water. It ought to be drank as common drink.

The excessive gravity alone of this mineral, however serviceable in other respects, may, if it happens to lie in any quantity in the interstices of the nervous filaments, induce symptoms of dangerous consequence,

as spasms, contractions, palsies, &c. which we find they commonly suffer, who have either been for a long time employed, in rubbing quicksilver upon looking-glasses, or in any work by which they are obliged to draw in mercurial fumes with their breath, or persons who have been too much daubed with mercurial ointments, as shall be observed.

Experience has convinced us, that repeated doses of crude mercury have in some cases, even a considerable time after they have been taken, exerted their force, and thrown the body into unexpected disorders.

I remember two accidents of this kind (and one of them proved fatal) in which, small quantities having been given for many days together, a violent salivation ensued, more than two months after the use of it had been left off. And I saw a young lady, who having swallowed about six drahms every morning, for three successive days,

days, was salivated three weeks. The flux then ceased, but returned at the expiration of six months, and held a month; and once more came on, in the same manner, two months after. The breath was each time strongly affected, as is usual in mercurial spittings, so surprisingly active is this mineral, even simple and uncompounded.

We may learn from hence, that it will be always right, in dealing with this slippery remedy, to take care that it has a free passage through the body, which must be done either by purging, or by combining it with substances, which will carry it off either by perspiration or urine; for what is called alcalifying it, does not deserve the name of a preparation.

Now as to sublimate, most certain it is, that the saline particles impart to the mercury a noxious quality; or, to speak more properly, that the salt receives from the mercurial corpuscles such an increase of its gravity and momentum, as renders its

cutting spiculæ more effectual and penetrating: the manner in which this matter is done, is probably this.

The component parts of the mercury, though so minutely divided by the action of the fire, as to rise in the form of a fume, yet are still solid and ponderous bodies; and by reason of their extreme minuteness, being perhaps simple and elementary corpuscles, they will easily be lodged in the pores and interstices of the saline crystals; which being composed of the atoms of salt, by sublimation variously combined and united, are a kind of cutting lamellæ or blades; the force of which could never have been very penetrating, upon the account of their lightness and easy dissolution, if the mercury, without blunting their edge, or breaking their figure, did not lend them an additional weight, and thus at the same time strengthen their action, and prevent their quick solution by the juices of the stomach, which cannot now disjoin their
com-

component parts, because the vacuities, into which they should, in order to do this, insinuate themselves, are already possessed, and taken up by the mercurial globules.

In short, these crystals, which are to be considered as so many sharp knives or daggers, wounding and stabbing the tender coats of the stomach, and abraiding their natural mucus, will irritate the nervous fibres; upon which convulsions and vomitings, with excessive pains, must follow. And the blood vessels being at the same time pricked, all the adjacent parts will be inflamed, and the blood stagnate; then come on ulcers, which, though singly small, yet being many in number, do all together make up large gangrenes. This being the nature of corrosive sublimate, it may not be amiss to enquire how it comes to pass, that this same compound, re-sublimed with live mercury in the proportion of four parts to three (for the sublimate will not take up an equal quantity)

especially if the operation be repeated three or four times, loses its corrosiveness to that degree as to become not only a safe, but, in many cases, a noble medicine.

Here then it is to be considered, that the action of the saline crystals depending upon their solidity and largeness, these necessarily must, by every subsequent sublimation, be broken into smaller and smaller parts. The mercurial globules, rising more quickly and easily than the salts, quit the interstices in which they were lodged, and the crystalline blades are divided every time more and more by the force of the fire; whereupon a new combination of the parts succeeds. And although there be a greater proportion of the mineral to the salts than before, which makes dulcified mercury specifically heavier than the corrosive, (for this contains two parts of salt, and one of mercury; whereas the dulcified, well prepared, has equal parts) yet the broken pieces of the crystals uniting into little masses of
figures

figures differing from their former make, these cutting points are now so much smaller, that they cannot make wounds deep enough to be equally mischievous and deadly ; and therefore only vellicate and twitch the sensible membranes of the stomach to such a degree, as excites them to an excretion of their contents and glandular juices, upward or downward, according as the force of the irritation is greater or less.

Thus a violent poison is mitigated into a vomit or purge ; nay, it may easily happen, (especially in robust constitutions, and if the bowels be at the same time by any means defended against the stimulating power of the medicine) that this twitching may be so slight, as to be almost insensible, and hardly troublesome. And then, the mercurial globules, being freed indeed from most of the saline parts in their passage thro' the primæ viæ, but still having a mixture of some few of them, are quickly conveyed into the blood, where,
by

by their motion and weight, they must necessarily dissolve the preternatural cohesions of all the liquors, particularly of those which circulate in the smallest canals, and are most viscid and tenaceous, making them more fluxile and thin, or of more easy secretion.

Whereupon all the glands of the body are, as it were, set to work, and scoured of their contents; but the salival ones especially, being many in number, very large and wide, and the juice they separate of a tough and ropy substance, so that a considerable quantity of it is accumulated before it is forced out at the orifices of those ducts, these effects will be most remarkable in them, and a salivation, or spitting, must continue until the active mineral particles are, through these, and the other passages, discharged out of the body.

We may also fairly conclude, from this reasoning, that the safest way of raising a salivation is by *internal* medicines; since,
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whatever mischiefs can be apprehended from these, may, in a greater degree, follow from the *external* use of mercury ; not only because, as we have already hinted, the mineral globules, being intimately combined with salts in the several preparations given inwardly, will, by the irritation of these, be easily and fully thrown out by the different emunctories, till the blood is quite discharged of its load ; whereas, in all the daubings with mercurial ointments, we can never be certain, that none of the heavy particles are left lodged in the interstices of the fibres, or cells of the bones ; but also, inasmuch as by computing the portion of mercury in all the doses necessary to promote a spitting ; and the weight of the same mineral, usually applied, when this is done by unction ; it will appear, that the quantity in the latter case vastly exceeds that in the former, and consequently, that the inconveniences to be feared will be in the same proportion.

Therefore

Therefore, this external management of quicksilver is chiefly to be recommended, where the constitution is not broken, or where ulcers and tumors require a particular cure, by liniments, &c. and a more thorough cleansing of the body. And even in such cases, it will certainly be best to anoint daily with small quantities, and not to raise a high spitting, but to promote the other secretions, particularly sweating and urine, by drinking plentifully of thin liquors; and also, if there be occasion, by laxative medicines; for it is well known, that cures are often wrought by these means, although the mouth has never been ulcerated by the mercury. At least, this method will afford a temporary relief, and enable the patient to recover strength; so that he may afterward, if it be necessary, undergo a more severe treatment.

It may be observed, that as the earliest use of mercury was in unguents and em-
plasters,

plaisters, so most of the prejudices and outcries against it are owing to the effects produced this way. For the first attempts to cure venereal maladies by this remedy were learned from the Arabians, who having recommended mercurial ointments in the lepra or scabies, gave a handle to the Italian physicians to try their efficacy, in removing the foulness of the skin from a new and terrible contagion; neither were they sparing of their liniments, which they continued to rub in for twelve, fifteen, nay sometimes for above thirty days together; so that it is no wonder, if they often met with very untoward symptoms from so severe a treatment; and (as some of them affirm) now and then found mercury in the rotten bones of their patients, who had, it may be, suffered too much, both from their disease, and their physician.

There

There are many histories of this kind; neither are instances wanting in living persons, of mercury running out of the body, from a tumour, either suppurated, or opened by a caustic; nay, there is a case upon record, in which, upon opening a vein, some drachms of it flowed out with the blood.

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CORROSIVE SUBLIMATE.

THIS substance taken inwardly, produces violent gripings in the stomach and bowels, distension, vomiting, great heat, thirst, cold sweats, tremors, convulsions, inflammation, gangrene, and finally death.

ANTIDOTES

Give large quantities of milk, honey, and sugar mixed, of warm water and oil, and add a scruple of ipecacuanha, to promote as quick a discharge upwards as possible, and throw up oily clysters. When you have obtained a plentiful evacuation both ways, let the person drink very plentifully of barley water, with gum arabic, sperma ceti, pulv. tragacanth. fat veal and mutton broths, milk, oil, &c. not forgetting to keep the body open for several days, in order to carry off
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48 CORROSIVE SUBLIMATE.

the poison. Alkaline salts in moderate doses, and frequently repeated, prove also serviceable, by separating a part of the acid from the mercury, and thus blunting its spicula.

M E A D.

Corrosive Sublimate, is nothing but a mixture of quicksilver with common salt. For, though it is always prepared with nitre and vitriol added to the salt, in different ways, the best of which is that described by Tachenius ; yet neither of these enter into the composition, serving only to facilitate the process (which they do by uniting with the alkaline parts of the salt, and thus freeing its acid from them :) as abundantly appears from this experiment, that mercury sublimed with the same proportion of nitre and vitriol, without salt, neither receives any increase of its weight, nor acquires any malignant quality.

The effects of this poison, when taken, are violent pains, with a distension of the belly ;

belly ; vomiting of a slimy, frothy matter, sometimes mixed with blood, and stools of the same kind ; an intolerable heat and thirst, with cold sweats, tremblings, convulsions, &c. as will appear from the following history, *Hippocrates Chymic.* cap. xxiv. To a large dog was given a drachm of mercury sublimite, mixed with a little bread ; within a quarter of an hour he fell into terrible vomitings, casting up frequently a viscid, frothy mucus, every time more and more bloody, and purged the same downward ; till tired and spent with this hard service, he laid down quietly as it were to sleep, but died the next morning.

The abdomen being opened, a great quantity of extravasated blood was found between the liver and stomach, and between the duplicature of the omentum about the stomach ; the guts, as well as the stomach, were distended, and full of a frothy, bloody mucus : on the outside they were of a livid colour, within all over red,

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and inflamed down to the very rectum. The fibrous coat of the stomach being taken off, between that and the nervous one, grumous blood was found in several places: the like was discovered here and there in the intestines, between the same coats.

The same symptoms with these, and manifest signs of a burning corrosion, followed with ulcers in the bowels, *Baccius de Venen.* pag. 21, observed in a young man poisoned by sublimate, mixed with his meat.

To this examination of the properties and effects of mercury, let me add, that there is another mineral poison, not very unlike it, either in its composition or action; this is arsenic, already treated of, which may be defined to be a volatile metallic salt; from the composition of arsenic we may readily understand the manner of its deadly operation, vide fol. 23.

It

It appears plainly, that the composition of arsenic is nearly the same as that of corrosive sublimate ; and as there the salts combined with the mercurial globules form cutting crystals, so here the metallic particles, which constitute the regulus, give a force and solidity to the saline bodies, which wound the stomach and guts ; in like manner the others do, even to such a degree as to cause mortifications.

Wepfer relates, that a dog having eat some fat, mixed with white arsenic, died the next day. The upper part of the stomach, when opened, was red and inflamed, the coats thinner than ordinary ; the bottom of it was covered with a fetid slime, and some pieces of fat ; the thin guts were so corroded, as to be pervious in three places ; two of the ulcers so large that they would easily admit a bean : the cavity of the abdomen contained a yellowish ichor tinged with blood.

Leonardo di Capoa tells us of a child killed by the violent vomiting and purging, occasioned from a slight wound made in the head by a comb wetted with oil, in which arsenic had been infused : for the pores of the body being opened by heat and exercise, some of the noxious effluvia might easily insinuate themselves into the part. Accordingly, Crato observed an ulcer of the breast caused by this application ; Verzascha violent pains, and fainting fits ; Diemerbroeck, and Dr. Hodges, death itself.

L E A D.

L E A D.

THE effects of lead on the human body are dangerous to those who are exposed to its vapours in the fire, and even to those who grind its *calx*, *minium*, *cerusse*, and *litharge*; for the painters are subject to violent gripes and constipations of the bowels, contractions of the limbs, and other disorders. Much more hurtful is the internal use of lead, corroded or dissolved by acids, as *cerusse*, *saccharum saturni*, or the salt of lead, the solution in vinegar, called *acetum lithargyri*, or the *tincture* drawn from the *saccharum* with spirit of wine, commonly called *tinctura antiphthifica*. The saturnine preparations are applied externally with safety, as coolers, repellents, and desiccatives; its calces, dissolved in oils, form the basis of most of the officinal plasters. Culinary vessels lined with a mixture of *tin* and *lead*, which

is the usual tinning, are apt to communicate to acid foods pernicious qualities, and require to be used with great precaution. An abuse of this mineral has been extended to acid wines, which dissolve so much lead, as to acquire a sweet taste, and then become slow poisons.

CERUSSE,

C E R U S S E,

O R

W H I T E L E A D.

A SORT of calx of lead is made by exposing plates of that metal to the vapours of vinegar. If when it is reduced into a fine powder, it is received in with the breath in inspiration, and carried down into the lungs, it causes terrible asthmas, that are almost incurable, and at last generally prove fatal : sad instances of the very pernicious effects of this metal are too often seen among those persons who work lead in any form, but particularly among the workmen who prepare white lead.

If a room has been painted with white lead, and a vessel full of water be let to stand in it for twenty-four hours, the said water will contract a most poisonous quality, which, if drank by any animal, will occasion in them convulsions, and kill them in a few hours.

F U M E S O F L E A D.

TH E cholic from the fumes of lead, is a disease to which all workers in lead are subject, and is attended with an intolerable pain in the intestines, and a most costive body, the navel is drawn inward, there is the highest inquietude, and the contraction of the joints, attended with a *nausea*, and a constant reaching to vomit. It is apt to terminate in a paresis [a kind of palsy] or a spasmodic asthma, which afflicts the patient a long time. These disorders are sometimes owing to the rashness of medicasters, in giving preparations of lead in the gonorrhæa and other distempers.

There is no better preservative against this disease, than taking *fat broth* in a morning. The cure is to be attempted with *olous clysters*, and a plentiful use of oil of *sweet almonds*, or *castor oil*, taken inwardly, with or without a *solution of manna*,

na, by which the desired end will generally be obtained. For the cure of the paresis, bathing in fresh water is necessary; after which the spine of the bark must be anointed with a *liniment* made of the *fat* of a *hog*, expressed oil of *nutmegs*, *ol. hyoscyami*, *saffron*, and oil of *Rosemary*, which is a speedy and a certain remedy.

This disease is called *Mill Reek*, by the miners at the *Lead-Hills* in *Scotland*, which all the inhabitants there are subject to; but melters of lead have it with the greatest violence. In the slightest stage of it, there is an uneasiness and weight about the stomach, particularly near the cartilago ensiformis, and sometimes it resembles a cholic in the intestines. The spittle of the patient is sweet, and inclining to a blackish colour, resembling that of a person who chews lead. The pulse is rather low, and the skin all over cold, with frequent clammy sweats. The legs become feeble, with a pricking numbness, and the whole body
is

is inert and enfeebled. Sometimes a spontaneous diarrhæa carries off the disease, but if it continues long it is very prejudicial. During this stage the patient is able to work.

When these symptoms continue long, and spirituous liquors are drank on an empty stomach, or after the working of lead, the *second stage* comes on; and then there is a fixed pain in the stomach and guts, especially in the lower part of the belly, extending from one hip-bone to the other, with an obstinate costiveness, and a gnawing pain. The pulse then becomes weak, and the skin hot. There is likewise a giddiness and a violent pain in the head, which is succeeded by an insensibility, and a delirium of the worst kind; for the patients bite their hands, and tear their own flesh. Then their extremities tremble with convulsions, and at length they sink with an intermitting pulse, and die *comatose*, or *apoplectic*. The smoke or fumes
of

of lead turn the adjacent grafs blue, hurt the water, kill birds in the air, beafts in the field, and affect dogs in the fame manner as they do men. Thefe laft, when they cannot rife, will tear up the ground they lie on.

If proper medicines are given in the firft ftage of the difeafe, the patient generally recovers. If it proceeds till the giddinefs comes on, the fuccefs is doubtful; but, after that, it almoft always proves mortal.

Thofe who work in lead fhould never go about their bufinefs fasting, and their food ought to be oily or fat. A glafs of *fallad* oil, with a little *brandy*, *rum*, or other fpirit, is a good morning's draught; but fpirits alone fhould never be taken while at work, nor immediately after it. *Phyfic fhould be taken Spring and fall*, and no man fhould go into the cold air while hot with labour, and they fhould change their working-cloaths for others as foon as poffible. Liquid aliment is beft, fuch as *fat broth*, with good *meat*; for low living is bad. They
 fhould

should now and then go a little way out of the tainted air. If the patient is plethoric, the cure is to be begun with bleeding, and then the primæ viæ must be cleansed with a double dose of *emetic wine*, or *emetic tartar*, otherwise it will have no effect. Such patients will even bear half a drachm of vitrum antimonii in fine powder, if plenty of *warm water* be drank during the operation. If the vomit works well upwards and downwards, the patient is in a fair way of recovery. And then a milder dose of *ippecacuanha* must be given, with *emetic tartar*. If the dose does not work either way, the patient is generally the worse for it, and a strong dose should be given soon after. If it vomits, but does not purge, an *antimonial cathartic*, or *jalap* and *mercury* should be exhibited in a larger quantity than ordinary, and in the intervals between each dose a table spoonful of castor oil; and then the patient should drink plentifully of *warm broth*. The vomits and purges should be repeated

repeated at proper intervals, till the disease disappears. If they operate too much, an opiate may be given at night, but with caution, for fear of rendering the patient costive, which is the worst thing that can befall him. When purgatives do not operate sufficiently, *emollient*, *laxative*, and *anodyne clysters* must be injected frequently, to empty the intestines. If blood and matter be voided with the fæces, emetics and purgatives must be forborne, till healing, balsamic, and laxative clysters, with mild food, cause these appearances to cease. When the belly is much swelled, emollient fomentations should be often applied thereto. But if a delirium has come on, the patient should be kept as quiet as possible during the little time he has to live. In some, when the complaint of the bowels has gone off, there is a pricking pain and feebleness of the legs, not unlike a rheumatism, and then they must be rubbed with coarse cloth or a flesh-brush. If that fails, embro-

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cate the part before the fire with *nerve ointment*, mixed with *oil of turpentine*: when the pains are violent, and the feebleness resembles a palsy, *blisters* must be applied to the part over the large nerves, and medicines for the palsy must be given inwardly. If the patient is emaciated with a hectic, and troubled with a giddiness in his head, talking oddly, he should ride every day, and take *bitters* with the *bark* and steel; if the giddiness continues, *myrrh pills*, with a small proportion of camphire, are highly beneficial.

A N T I M O N Y.

ANTIMONY, in natural history, is a blackish mineral substance, staining the hands, full of long, shining, needle-like striæ, hard, brittle, and considerably heavy.

Antimony has been by many esteemed to be a poison. It is certain however that antimony, in its *crude state*, is not a poison, but a medicine of great efficacy; and an excellent resolvent and purifier of the juices, if given from four grains to half a drachm, along with absorbents: it is capable indeed of being rendered, by various operations and additions, either truly poisonous, or more medicinal, than in its crude state; not but that its most virulent preparations may, by slight alterations in the mode of preparing them, be made salutary; and its most salutary ones *virulent*.

Antimony,

Antimony is not a pure semi-metal, but a sulphurated semi-metal. When thrown into the fire, it burns with a blue flame, and emits sulphureous vapours : on digesting powdered antimony in aqua regia, the metallic part is dissolved, and the sulphur left behind. The sulphur of antimony, purified from the metallic part, is perfectly the same as the common brimstone of the shops, possessing the same properties, and answering the same purposes : if the semi-metal, freed from the sulphur naturally mixed with it, be afterwards melted with common brimstone, it resumes the appearance and qualities of crude antimony.

Pure regulus of antimony, by whatever means obtained, is a light semi-metal, resembling tin or dusky silver ; without any thing of the blueish cast of zink, or the yellowish one of bismuth, about seven times specifically heavier than water, moderately hard, entirely brittle, and of a sparkling plated texture. If exposed to a moderate fire,
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smokes copiously, and by degrees totally evaporates; by a gentle fire continued for some time it is changed into a whitish calx, which, on raising the heat, melts into a yellowish or reddish glass. Melted with silver or other malleable metals, it renders them hard and brittle. It destroys the magnetic power of iron, which other metallic bodies only weaken, in proportion to their quality. It does not amalgamate, or not without great difficulty, with mercury; if a mixture of it with silver and copper be reduced into fine powder, even those metals will not, in that state, be acted upon by mercury.

In the human body it acts as a virulent emetic and cathartic; and impregnates vegetable acids, as vinegar and acid wines, with those virtues, almost inexhaustibly. By sulphur, and by calcination with nitre, its malignity is abated, and its emetic power changed into a diaphoretic one. As soon as it is restored to its pure metallic state,

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it resumes its virulence, which may be again destroyed, again restored, and almost infinitely varied.

Hoffman has given an account of the different medicinal effects of antimony, as depending on its different treatment. He observes, that crude antimony, on account of the regulus being corrected by the sulphur, is not only safe, but in many cases a medicine of great service, both for man and other animals. That by simple fusion it acquires a degree of malignity ; but a far greater, if melted with half its weight of nitre, which consumes nearly all the sulphur, and leaves the regulus bare. That antimony, or its regulus, mixed with common salt, calcined over a gentle fire for several hours, and kept continually stirring and afterwardsedulcorated with water, yields an ash-grey calx, which is so fixed as to bear a melting heat, and proves a mild and safe diaphoretic, void of any malignant
or

or emetic quality. That antimony, by calcination with a gentle fire in an earthen vessel, in the open air, changes into a calx, which melts with difficulty, and which has no malignity. *But that if this calx be melted with a strong fire into a glass, it becomes so active, that a few grains will occasion a violent vomiting and purging, or even mortal convulsions and inflammations.*

That the powdered regulus, calcined in a glass-vial, placed in sand for several days, becomes a greyish diaphoretic powder; *which reduced into a regulus by fusion with powdered charcoal, nitre, and a little fat, proves again virulent.*

That when antimony is melted with one fourth its weight of salt of tartar, the whole poured into a mould, the *scoria* separated, and the more ponderous matter pulverized, the reddish powder thus obtained is salutary; *but that when antimony is melted with three or four times its weight*

of salt of tartar, both the scoriæ and the regulus are virulent.

That equal parts of antimony and nitre, melted together, yield a virulent mass; but one part of antimony, with two or three of nitre, is an useful diaphoretic. That on melting the diaphoretic calx with fat, charcoal powder and nitre, the virulent regulus is revived.

And thus one preparation may be changed into another of very different virtues; a salutary into a poisonous, and a poisonous into a salutary one: different acids have different effects upon antimony; thus, whilst the marine acid renders it either *corrosive* or *emetic*, the addition of the nitrous acid destroys the virulence, and renders the antimony mildly diaphoretic. All the antimonial sulphurs are emetic and cathartic.

Glass of antimony. The glass may be easily made, by urging the calx in a crucible, with a strong fire, and throwing in
towards

towards the end a little crude antimony or sulphur : when the vitrification is completed, the glass is poured on a copper plate, or on a flat stone. The glass of antimony is used only for making other emetic preparations, as the emetic wine, &c.

Glass of antimony reduced into powder, and exhibited, causes enormous vomitings, with most cruel gripes, which often end in death ; and this Hoffman says, he has known it to do in a few hours.

Hepar antimonii, liver of antimony. Equal parts of crude antimony and nitre mixed together, set on fire and suffered to deflagrate in an iron mortar, which may be covered with a perforated plate ; or injected by degrees into an ignited crucible, yield a liver-coloured mass, called hepar antimonii, which, pulverized and edulcorated with water, is named crocus metallorum. *Two, three, or even one grain of either of these preparations, occasion violent anxieties*

and vomitings; though a dog will bear a dram, and a horse a whole ounce, without being apparently any otherwise affected, than in having the alvine discharge increased.

The emetic wine, emetic tartar, and other medicines made from the glass, may also be made from the crocus,

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O F
VENOMOUS EXHALATIONS
FROM THE
EARTH, POISONOUS AIR, AND
STAGNANT WATERS, &c.

BESIDES these already treated of, there is yet another way of being poisoned, and that is, by venomous steams and exhalations, or by a poisonous air taken into the body by the breath.

This is notorious enough, and authors upon many occasions make mention of it; but when they come to explain the particular manner how this virus kills, they most commonly reduce it to some of the poisons, which prove destructive, by being admitted into the stomach; alledging, that malignant fumes and airs are fa-

tal, because impregnated with arsenical, mercurial, and the like hurtful particles, which they convey into the body; and, being of a very corrosive nature, must necessarily injure both the fluid and solid parts.

And indeed, that the fumes of these same minerals are very pernicious, and are filled with their atoms very unfit for respiration, is most certain; but to argue from hence, that all deadly vapours and malignant airs owe their mischievous quality to these only, is too fond and ill-grounded a conceit; since, upon a due enquiry, it will appear, that there may be, and are, mortiferous exhalations from the earth, infecting the air, of a nature so different from any of these poisons, that the very substance, from which they arise, may not be at all hurtful, if taken into the stomach itself.

Venomous steams and damps from the earth are not unfrequent, and tho' mostly found in mines, pits, and other subterraneous places, yet they are sometimes met
with

with on the surface of the earth too, especially in countries fruitful of minerals, or pregnant with imbowelled fires; such are Hungary and Italy, the latter of which, as Seneca takes notice, has always been remarkable for them.

The celebrated Mofeta, a place about two miles distant from Naples, just by the Lago d'Agnano, in the way to Pozzuolo, or Puteoli, is commonly called la Grotta del Cani, because the experiment of its deadly nature is frequently made upon dogs; though it is as certainly fatal to any other animal, if it comes within the reach of its vapour: for Charles the Eighth king of France proved it so upon an ass; and two slaves put into it by order of D. Pietro di Toledo, viceroy of Naples, with their heads held down to the earth, were both killed. It is a small grotto at the foot of a little hill, about eight feet high, twelve long, and six broad. From the ground arises a thin subtile, warm fume, visible

visible enough to a discerning eye, which does not spring up in little parcels here and there, but is one continued stream, covering the whole surface of the bottom of the cave; and has this remarkable difference from common vapours, that it does not, like smoke, disperse itself into the air, but quickly after its rise falls back again, and returns to the earth; the colour of the sides of the grotto being the measure of its ascent, for so far it is of a darkish green, but higher only common earth, and this is about ten inches; and therefore, as I found no inconvenience by standing in it, so no animal, if its head be kept above this mark, is in the least injured. But when (as is usual) a dog, or any other creature, is forcibly held below it, or by reason of its smallness cannot hold its head above it, it presently, like one stunned, loses all motion, falls down as dead, or in a swoon, and the limbs are convulsed and tremble, till at last no other sign of life appears,

pears, than a very weak and almost insensible beating of the heart and arteries; which, if the animal be left there a little longer, quickly ceases too; and then the case is irrecoverable, as in one perfectly strangled. But if the animal be taken out in time, and laid in the open air, it soon comes to life again; and the sooner, if thrown into the adjacent lake, which, by constringing the fibres of the skin, in the manner of a cold bath, puts the blood again into circulation.

A lighted torch, is extinguished in a moment, when dipped into the vapour. A pistol cannot take fire in it. If a weather-glass be so fixed in the grotto, that the tube is wholly covered with the vapour, the quicksilver neither falls nor rises otherwise than in the outward air.

In order therefore to understand wherein this deadly power consists, it must be observed, that the use of respiration is twofold; the first, that the blood, in its passage through the lungs, may, by the elasticity

ticity of the air, distending the vesiculæ, and thus pressing upon the arteries, be comminuted and broken, so that no cohesion of its parts may hinder the secretion of those humours, which in the several glands are to be secreted from it: the other is, that the blood may be supplied with something from the air, whatever it be, necessary to life.

That there is a vivifying matter from the air, which passes into the blood by the breath; and that the same quantity of it will not suffice long for breathing, though it be deprived of none of those qualities, by which it is fitted to inflate the lungs, and agitate the blood. The case being thus, since (as I have mentioned) the mercury in the barometer is not altered in its ascent by this vapour, *i. e.* that there is no want of gravity and elastic pressure in it, at least to a considerable degree; we must conclude, that there is some quality in it, which, when it is drawn into the lungs, prevents
and

and stops the usual communication of the enlivening spirit from the air to the blood.

It is sufficient to say, that there can be no real poison here. All that is discovered by the earth from which the fume arises, is no more, than that it is of a greenish colour, with a subacid taste, very much like that of the phlegm of vitriol; so that it may very well be called an unctuous vapour of the vitriolic kind, raised by a subterraneous heat.

It is certainly necessary to the inflation of the pulmonary vesiculæ, and the subsequent entrance of the subtile matter from the air into the blood, that the nervous fluid should have a free course into them; it is therefore highly probable, that these vitriolic particles in the fume have a counter-action or repulsive force to the elastic matter of this liquor; by means of which the fibrillæ, into which it should pass, being deprived thereof, become quite relaxed and lose their force.

Neither

Neither ought it to seem strange, that the animal spirits should be so suddenly interrupted in their action, by the interposition of a ponderous fluid; since we see every day, how instantaneously, on the other hand, their motion is quickened and revived by the application of volatile salts to the nostrils; and it may be observed, that these are always alkaline; that is, of a nature quite opposite to vitriolic or acid spirits, so as readily to fall into a conflict or fermentation with them. To conclude this part of our discourse, I think it is a sufficient confirmation of this reasoning, that in frogs killed in this grotto, the bladders of the lungs (more visible otherwise, and distinct in these creatures than in most others) were found quite subsided, and empty of air.

But if any one desires a farther proof, he may, according to these principles, make, as L. di Capoa did, an artificial mephites: for if *antimony*, *bismuth*, or any
other

other such mineral, be finely powdered and moistened with *aqua fortis*, or *spirit of nitre*; there will arise a great heat, with a thick dark smoke, in which, as in this grotto, torches are extinguished, and animals, tho' but slowly, are stifled and killed.

The mortal effects of subterraneous damps, in mines, deep wells, and the like close places; as also of the fumes of confined burning charcoal, may be accounted for in the same way; these being generally *acid* exhalations from mineral substances. And as in animals, which have died in the above described grotto, the vesicles of the lungs subside, wanting their due tension from the animal spirits; so in the dissection of a man killed by the *vapour of charcoal*, carried from a baker's oven into a deep cellar, as the story is related in the Memoirs of the royal academy at Paris, the brain appeared dry, and the muscles of the arms and thighs so relaxed, that they seemed separated

parated from the parts to which they belonged.

But it must here be observed, that, in some cases of this nature, the mineral particles are mixed with so small a proportion of water, that, instead of extinguishing a flame, they will themselves, like gunpowder, take fire, and burn at the approach of a candle. Vide Phil. Transf. fol. 442. and an experiment, made by a mixture of *oil of vitriol* and *filings of iron*, confirms the truth of our reasoning on this head.

Thus it is shewn how death may enter at the nostrils, though nothing properly venomous be inspired.

Hippocrates observed the constitution of the air, which preceded pestilential fevers, to be great heat, attended with much rain and southern winds; and Galen takes notice, that no other than a moist and hot temperament of the air brings the plague itself; and that the duration of this constitution

stitution is the measure of the violence of the pestilence.

For it is a common observation in the East Indies, that during the dry heats the season is healthful, but when the rains fall immediately upon the hot weather, then untoward fevers begin to threaten. It has been fully proved, that malignant and pestilential fevers are owing to a viscid and tenaceous lentor or slime, which first obstructs the capillary arteries, and afterwards, being dissolved by heat, ferments with the blood: and then this slimy mucus, being again taken into the circulation, in the nature of a ferment, disturbs the whole mass, and alters its natural properties.

It must indeed be owned, that some malignant fevers are contagious, and that contagion is a real poison: but the original cause of a disease, and the communication of it, are very different things. When a fever is communicated by way of infection

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from

from one already diseased, this most commonly happens at the latter part of the distemper, that is (as in the hydrophobia) when the fermenting blood is throwing off great quantities of its active particles upon the glands of the most constant and easy secretions; such are those in the surface of the body, and in the mouth. These therefore being by the air drawn into the lungs of a sound person, and likewise insinuating themselves into the pores of the skin, will affect first the nervous fluid, and then the blood, and produce the like fermentation and disorder, which had been bred in the body in which they were formed. The way by which bad food, ill ripened fruits of the earth, &c. often produce malignant and pestilential diseases, is not very different from that, by which we have observed unwholesome airs to cause the like effects. For the juices with which these supply the blood, being corrupted, must necessarily make a fluid neither

ther fit for nutrition, nor for the animal secretions; it is therefore no wonder, if, besides the other symptoms, sore pustules, inflammations, ulcers, &c. (more common in fevers from this cause than in any others) are raised in the surface of the body.

Thus much concerning poisonous exhalations and airs, so far as the consideration of the grotta del cani has led us to enquire into their effects. For though there may be other alterations of this same element, differing in their nature from this we have insisted upon, and yet equally pernicious and hurtful; yet we take no notice of any of them, in regard that those which proceed from arsenical, mercurial, and the like fumes, are reducible to a foregoing essay; and those, which are owing to a change of the known properties of the air, may be easily explained, by what has been already said in this chapter. I shall therefore mention the mischief of another fluid,

which, as it is the next in use to this, so the bad qualities of it, when it comes to be altered, must necessarily be almost equally fatal and dangerous.

I mean water, which is of such constant use, not only for our drinks, but also in preparing of our flesh and bread, that it may justly be said to be the vehicle of all our nourishment; so that whenever this happens to have other properties than are necessary to fit it for this purpose, it is no wonder, if in its passage through the body these make suitable impressions there: for, let the gross particles, with which the water is saturated, be of any other nature, as metallic, saline, &c. these, according to their various gravity, the capacity of the canals, and such like circumstances, will, when they come to circulate in the animal body, be by the laws of motion deposited in one part or other.

For this reason, the choice of water for drink among the antients was by weight,
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the lightest being preferred, as most free from all heterogeneous bodies.

The reason therefore why some springs are poisonous is, their having corrosive corpuscles mixt with their water, which cannot fail, when forsaken by their vehicle, in the canals of the body, to do the same mischief as they would have done, if they had been taken by themselves undiluted; only with this difference, that they may in this form be carried sometimes farther into the animal œconomy, and so having passed the primæ viæ, discover their malignity in some of the inmost recesses. Thus the fons ruber in Ethiopia, mentioned by Pliny, about which abundance of native minium or cinnabar was found, shewed its ill effects chiefly on the *brain*: we shall not need to enlarge on this matter; since any of the forementioned mineral poisons may thus impart their deadly quality to waters; and accordingly there are instances of arsenical, mercurial, &c. fountains, some of which

Baccius mentions, and a very remarkable one is taken notice of in the Philosophical Transactions.

As to waters, there are some alterations of them, which, though not properly poisonous, yet are of so great consequence in their effects, that they very well deserve to be regarded.

This I shall do with respect to a great abuse, of this kind committed in some cities; and that is, in chusing sometimes stagnating impure well-water for the brewing of beer, and making other drinks. Such a fluid, indeed, has oftentimes a greater force and aptness to extract the tincture out of malt, than is to be found in the more innocent and soft liquor of rivers: but for this very reason it ought not, unless from mere necessity, to be made use of; this quality being owing to the mineral particles, and aluminous salts, with which it is impregnated.

Pliny tells us, “ that those waters are
 “ condemned in the first place, which,
 “ when

“ when boiled, incrustate the fides of the
 “ veffels.” And that our well-waters do
 this, no body who looks into the common
 tea-kettles can be ignorant.

Sanctorius teaches us, “ that heavy
 “ water converts the matter of transpira-
 “ tion into an ichor, which being retained,
 “ induces a cachexy.”

O F

ACCIDENTS OR SYMPTOMS,

PRODUCED BY THE VAPOURS OF COAL,
AND OF WINE AND OTHER FER-
MENTING LIQUORS.

NOT a single year passes, without the destruction of many people by the vapour of charcoal, or of smaller coal, and by the *steam* or vapour of wine, &c.

These symptoms occur, when small-coal, and especially when charcoal is burnt in a chamber close shut, which is direct poison to a person confined in it. The sulphureous oil, which is set at liberty and diffused by the action of fire, expands itself through the chamber; whence those who are in it perceive a *disorder* and *confusion* in their *heads*; are affected with a *vertigo*, *sickness* at the *stomach*, a *weakness*, *convulsions* and *tremblings*; and if they fail of
presence

presence of mind, or of strength, to get out of the chamber, *die* in a short time. Tissot saw a woman who had vertiginous commotions in her head for two days, and almost *continual* vomitings, from her having been confined less than six minutes in a chamber (notwithstanding both one window and one door were open) in which there was a chafing dish with some burning coals. Had the room been quite close, she must have perished by it.

This vapour is narcotic or *stupefying*, and proves mortal, in consequence of its producing a *sleepy* or *apoplectic* disorder, though blended, at the same time, with something convulsive; which appears, from the closure of the mouth, and the strong contraction or *locking* of the *jaws*.

The condition of the brain, after death, in persons thus destroyed, proves, that they die of an apoplexy. Notwithstanding, it is very probable, that suffocation is also partly the cause of their deaths;

deaths ; as the lungs have been found stuffed up with blood, and livid.

It has also been observed, in some other such bodies, that patients, killed by the vapour of burning coals, have commonly their whole bodies swelled above one-third more than their magnitude, when living. The face, neck, and arms are swelled out, as if they had been blown up ; and the whole human machine appears in such a state, as the dead body of a person would, who had been violently strangled ; and who had made all possible resistance for a long time, before he was overpowered.

Those who are sensible of the great danger they are in, and retreat seasonably from it, are generally relieved as soon as they get into the open air ; or if they have any remaining uneasiness, a little water and vinegar, or lemonade, drank hot, affords them

them speedy relief. But when they are so far poisoned, as to have lost their feeling and understanding, if there be any means of reviving them, such means consist:

1. In exposing them to a very pure, fresh and open air.

2. In taking some blood from the arm.

3. In putting their legs into hot water, and chafing them well.

4. The second application ought to consist in making them smell to some very penetrating odour, such as the volatile spirit, or volatile salt of sal. armoniac; and afterwards to surround them, as it were, with the steam of vinegar.

5. In making them swallow a large quantity of lemonade, or water and vinegar, with the addition of nitre. And,

6. In throwing up sharp glysters.

As it is manifest there is something spasmodic in these cases, it is proper to be provided with some antispasmodic remedies, such

such as the mineral anodyne liquid of Hoffman.

A vomit will be hurtful ; and the reachings to vomit arise only from the oppression in the brain.

It is highly imprudent to sleep in a chamber while either charcoal or small-coal is burning in it ; and the number of imprudent persons who have never awaked after such a step, is so considerable, and so generally known too, that the continuance of this unhappy custom is astonishing.

The bakers, who make much use of small coal, often keep great quantities of it in their cellars, which frequently abound so much with the vapour of it, that it seizes them violently the moment they enter into the cellar. They sink down at once deprived of all sensation, and die, if they are not drawn out soon enough to be assisted, according to the directions just given.

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The certain means to prevent such fatal accidents is, upon going into the cellar to throw some flaming paper or straw into it, and if these continue to flame out and consume, there is no reason for dreading the vapour: but if they be extinguished, no person should venture in, till, after opening the vent hole, a bundle of flaming straw, &c. has been set at the door, which serves to attract the external air strongly. Soon after, the experiment of the flaming paper has been repeated, and if the flame still goes out, more straw is to be set on fire before the cellar door.

Throwing some salt on live coals, before they are put into a chamber; or casting a piece of iron among them, to imbibe some part of their deadly narcotic sulphur, is useful, yet not sufficient to prevent all danger from them.

When the most dangerous symptoms from this cause disappear, and there remains only some degree of weakness, of
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numbness, and a little inappetency, or loathing at the stomach, nothing is better than *lemonade*, with one *fourth part* wine, half a cup full of which should frequently be taken with a small crust of bread.

T H E

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F U M E S
O F
F E R M E N T I N G L I Q U O R S.

THE vapour which exhales from wine, and in general from all fermenting liquors, such as beer, cyder, &c. contains something poisonous, which kills in the like manner as the vapours of coal; and there is always some danger in going into a cellar, where there is much wine in the state of fermentation; if it has been shut up close for several hours. There have been many examples of persons struck dead on entering such cellars, and of others who have escaped out of them with difficulty.

When such unhappy accidents occur, men should not successively be exposed, one after another, to perish, by endeavouring
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to fetch out the first who sunk down upon his entrance; but the air should be immediately purified by the method already directed, or by discharging some guns into the cellar; after which with precaution people may venture in. And when the persons afflicted are brought out, they are to be treated like those affected with the coal vapour.

Tissot saw a man who was not sensible of the application of the spirit of sal. ammoniac, till about an hour after he was struck down, and who was entirely freed at last by a plentiful bleeding; though he had been so insensible, that it was several hours before he became sensible of a dangerous wound, which he had received in the fall.

E X H A-

EXHALATIONS

FROM

C A V E S, &c.

WHEN subterraneous caves that have been very long shut are opened; or when deep wells are cleansed that have not been emptied for several years, the vapours arising from them produce the same symptoms I have mentioned, and require the same assistance. They are to be cleansed and purified by burning sulphur and salt-petre in them, or gunpowder, as compounded of both.

The offensive stink of lamps, and of candles, especially when the flame is extinguished, operates like other vapours, tho' with less violence, and less suddenly.

Nevertheless, there have been instances of people killed by the fumes of lamps fed with *nut oil*, which have been extinguished in a close room. These last smells

or fumes prove noxious also, in consequence of their greasiness, which being conveyed, together with the air, into the lungs, prevent respiration. And hence we may observe, that persons who have weak, delicate breasts, find themselves quickly oppressed in chambers or apartments, illuminated with many candles.

Let the patient be immediately carried into the open air, and let the air be fanned backwards and forwards to assist its action; let cold water be thrown on the face, and let the face, mouth and nostrils be repeatedly washed; and as soon as practicable get the patient to drink cold water. But if the case is too far gone to be thus relieved, let a healthy person breathe into the mouth of the patient; and gently force air into the mouth, throat and nostrils. Frictions, cupping, bleeding, and blisters are likewise indicated. The steam of vinegar is also very serviceable in such cases.

O B S E R-

OBSERVATIONS

UPON

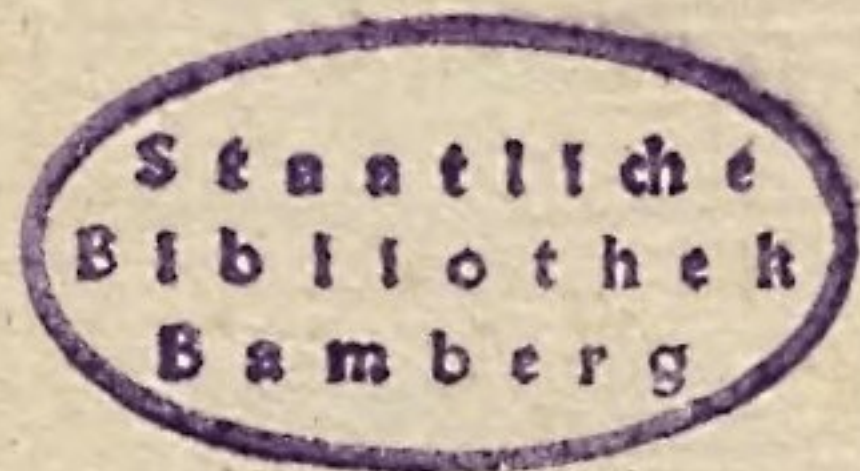
A I R.

BY the word air, I do not mean the mere element so called, but the atmosphere of the earth, which being composed of a great many various particles, may be hurtful or beneficial to us a great many ways. The different states of the air, either for preserving health, or repelling diseases, are therefore daily to be observed.

Examples will elucidate this : a very dry and cold season, during the continuance of a north or north-east wind, contracts the whole habit of the body, strengthens the fibres, renders the vessels tighter and stronger, and thickens the fluids ; moreover, it accumulates, and strongly compresses the globules of the blood : in the words of *Celsus*, it strengthens the whole body, and

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renders



renders it more nimble and active; therefore, in the opinion of Hippocrates, the north-east wind is of all winds the most wholesome. But if such a season continues longer than usual, the solids become too much contracted, and too elastic; and the fluids too thick, and very glutinous, so as to be unfit for passing along the smallest vessels; for it not only brings a visciduity upon the fluids, which endangers an inflammation, but likewise so much condenses the red globules of the blood, as to make it difficult for them to pervade the extreme capillary ramifications of the arteries, because, by being rendered harder than they ought to be, they cannot easily change their round figure into an oblong one, in order to render their passage the more easy; and as the capillary arteries are already contracted by the cold, they strongly resist any distension. From hence arise obstructions, inflammations, pleurifies, inflammations of the lungs, quinsies, rheumatisms, and in short all those

those diseases which proceed from a thick, viscid, and inflamed blood, propelled by a very much increased force of the heart and arteries ; for the more the vessels are contracted by the cold, the more they are compressed by the weight of the atmosphere, and the fluids contained in them move with a proportionably greater velocity, which causes a greater friction, and that a greater heat ; which at last thickens and condenses the blood to a very high degree. All these effects are certain and constant ; for during this state of the air, the blood taken even from a man in perfect health, is very thick, and for the most part glutinous ; but much more so upon the approach of a fever.

This morbid visciduity does not however come on all at once, but gradually after north-east winds and a dry season have long prevailed ; and we are to observe not only what weather we have during this season, but what sort of weather has immediately

preceded. But to men of a lax and phlegmatic habit of body, this state of the air, so far from being hurtful, is extremely beneficial, bracing up their fibres, and rendering them more active and lively. Thus the winter agrees best with one kind of constitution, and the summer with another. Hence this seems to be the cause, that one species of epidemical fevers proves fatal to the strong and robust, but favourable to the puny ; whereas another, which is occasioned by a moist and warm air, makes most havock among the latter. Therefore, from a great change in the atmosphere, an epidemical distemper is either greatly changed, or altogether suppressed ; as experience proves.

Now in order to guard against, and even to remove the evils of a dry and cold season, we should drink plentifully of diluting, emollient, and warm liquors, and use a mild moist relaxing diet ; nor should persons ever venture abroad before they have drank
something

something warm, whether they travel on foot, or on horseback, against these north-east winds. And if any one finds himself rather indisposed from this cause, and feverish, especially if the disorder is attended with a sore throat, or a pain in the side, let him be immediately bled, and if the fever increases, the operation be repeated, as it is a certain rule, that phlebotomy is never more safe or successful in acute distempers, than during a cold and dry constitution of the air, and when the barometer continues high; nor does this hold good only in pleurifies and inflammations of the lungs; but also in many other diseases, such as the small-pox, measles, rheumatism, cholics, &c. Nay, even in quotidian and tertian intermittents, the opening of a vein is extremely proper, otherwise they frequently bring on a continual ardent or inflammatory fever.

On the other hand, a moist warm state of the atmosphere relaxes the fibres too much, diminishes the force of the vessels, makes

the blood phlegmatic, sluggish, and poorer than it ought to be, and renders the whole body spiritless, humid, languid, and disposed to flow, putrid, long, intermitting fevers. Here, therefore, a quite contrary sort of diet and medicine is to be made use of, viz. such as will harden the solid parts of the body, preserve the temperaments of the fluids, and strongly compress the globules of the blood. That is to say, rough, cold, generous kinds of drink, a strengthening, drying, astringent diet; the cold-bath, and other things of the same kind. As to fevers in this state of the air, blood-letting is of very little use; nay, if freely used, it is very hurtful; for such fevers arise from a weakened power of the heart and arteries, from a too lax texture of the blood, and from a sluggishness in the fluids; hence arises a stagnation, and a liquid vital corruption; and this is the reason that slow, putrid, malignant, intermitting fevers are always the consequences of such a season;
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in the cure of which strengthening remedies, and not such as render the body feeble, are required. For very often, whilst such seasons prevail, quotidian and tertian agues degenerate into long, very dangerous, continual putrid fevers, from which, if patients escape, they for the most part fall into the yellow jaundice, or a dropfy. And indeed they are never sooner or more successfully restored to health, than by a change of the atmosphere to serene, dry, and clear weather, and, in consequence thereof, the mercury's rising high in the barometer.

This I have constantly observed, and the same was formerly taken notice of by that old and celebrated practitioner, Fred. Hoffman. Whereas such patients very slowly recover, whilst the cloudy and rainy south-wind blows.

Moreover, a cold moist state of the atmosphere is not a little pernicious; for it injures us in a great many ways, but chiefly
by

by insinuating cold exhalations into the body, and highly obstructing perspiration : in such a constitution of the air, we are then to wrap ourselves up in warm cloaths, to keep a good fire, and, by a proper regimen, to guard as much as possible against these chilling vapours. In fine, we are by all possible means to promote perspiration, amongst which, frequent frictions of the whole body before the fire, with hot flannels or a flesh-brush, contribute greatly to increase the cutaneous discharge, and consequently to health, as does also daily exercise, and that even more violent than usual.

Thus we ought always to combat, and guard against a peculiar intemperate constitution of the air,

O F

VEGETABLE POISONS.

HEMLOCK, common.

ditto ——— drop-wort.

Long-leaved Water Hemlock.

NAPELLUS, or Monks-hood.

NIGHT-SHADE, deadly.

Black cherry Night Shade.

Egg ——— ditto.

Mad ——— ditto.

Drowfey ——— ditto.

Pear-fruited ——— ditto.

Rivina, or American ditto.

DATURA.

Proliferous Datura.

SENSITIVE PLANT, its branches.

CANADIAN, flat lemon-tree root

AMERICAN FLEA PLANT.

LANCINIATED RUDBECKIA, or Ca-
nañian sun-flowered Aconite.

Yellow

108 VEGETABLE POISONS.

Yellow Pyrenean Aconite.

Proliferous Mountain Crow-Foot,

or Portugal Crow-Foot.

Golden proliferous Crow-Foot.

Oriental meadow Crow-Foot.

Double white Crow-Foot

White Alpine, or great white Mountain Crow-Foot.

BLACK HELLEBORE.

Dark flower'd white Hellebore.

OPIUM, or the white Turkish POPPY.

COMMON LAUREL.

BITTER ALMONDS.

KERNELS of BLACK CHERRIES.

HENBANE or Hyosciamus.

————— Seeds of ditto.

WOLF'S BANE, or Winter Crow-Foot.

GREAT DORONICUM, or Leopard's Bane.

Tree and Apple of the Manchenille.

THAPSIA, or deadly Carrot.

SOW-THISTLE.

The YEW-TREE.

WILD

WILD CUCUMBER.

FLEA WORT, or Water Crow-Foot.

COCULUS INDICUS.

NUX VOMICA.

The most dangerous vegetable poisons are the true hemlock, wolfs-bane, the deadly night-shade, henbane, and datura ; to which may be added the roots of hemlock-drop-wort ; the common hemlock is so far from being poisonous, at least in small quantities, that it has of late been found very efficacious in the cure of several most obstinate disorders. But hemlock, eaten inadvertently, has produced pains in the stomach and præcordia, with a sense of pricking and heat therein, attended with giddiness, a vertigo, epilepsy, and the abolition of the senses, with a strange shaking and distortion of the body ; universal spasms ; a flux of blood from the ears ; a swelling as big as ones fist at the pit of the stomach ; hiccough, fruitless reaching

reaching to vomit; a swelling of the face and abdomen; and a flux of green froth from the mouth after death.

A N T I D O T E S.

Allen thinks a vomit of warm water and oil, taken in large draughts, and often repeated, will be of great service, or warm water, with fresh butter, as also milk and oil as beforementioned, or fat broths, which he also recommends, or any thing else which operates quickly; for other preparations only allow the poison to take deeper root, and therefore ought not to be waited for. If the above things will not provoke the patient to vomit, *oxymel* of squills, salt of vitriol, or a decoction of tobacco may be used, as having a more immediate effect, and the quicker the better; it is hardly safe to give even the most
gentle

gentle cathartic : the stomach being thus emptied, recourse must be had to generous wine, and alexipharmics ; such as Venice treacle, the bezoardic powder, confection of alkermes, the alexipharmic bolus, alex-iterial draught. Diaphoretic cardiac, (in phar. mar. &c. &c.)

When there is a suspicion that the coats of the stomach or intestines are corroded or ulcerated, it will be improper for the patient to use spices or vinegar, or to indulge in too much wine ; but he ought to take a decoction of barley, with raisins ; or a decoction of china-root, saffrafras, &c.

The same method is most likely to answer, when any other deleterious herb or root has been eaten by mistake, though the particular species should not be known ; and Hoffman affirms, that when the patient has been stupified by narcotics, the best remedies are vomits, mixed with oil, to facilitate the operation.

The

The most noted of the indigenous poisonous plants are,

The *CICUTA* and *ACONITUM*.

The former is of two sorts, our common hemlock, and the aquatica, which Ray calls *cicutaria palustris tenuifolia*.

What the *cicuta*, so much in use of old for poisoning malefactors, especially at Athens, was, we don't know: it is most probable, that it was not a simple but a compound. The history of the noble death of Socrates, related by his disciple Plato, seems to evince it to have been a mixture of some anodyne juices with others of a corrosive nature.

Theophrastus says, that Thrasyas, a great physician, had invented a composition, which would cause death without any pain; and that this was prepared with the juices of hemlock and poppy mixed together, and did the business in a small dose.

An

An extract of this kind might perhaps take away life with such symptoms, as carried off this great philosopher, viz. the eyes fixed, heaviness and insensibility in the legs, and then great coldness in them, which by degrees seized the vital parts.

It is recorded of the people of Marfeilles, that anciently they had a poison kept by the public, in which Cicuta was only an ingredient; a dose of which was allowed by the magistrates to any one, who could shew a reason why he should desire death.

O F

H E M L O C K.

CICUTA, or hemlock, is a tall umbelliferous plant, with large leaves, of a blackish green colour on the upper side, and a whitish green underneath, divided into a number of small oblong, somewhat oval segments, which stand in pairs on middle ribs: these segments are again deeply cut, but not quite divided, on both sides; and many of these ultimate sections have one or two slighter indentations. The stalk is round, smooth, hollow, irregularly variegated with spots and streaks of a red or blackish purple colour. The flowers are white, the seeds greenish, flat on one side, very convex, and marked with five furrows on the other. The root is oblong, about the size of a middling parsnip, yellowish without, white and fungous within. The plant is biennial;

nial ; common about the sides of fields, under hedges, and in moist shady grounds ; and flowers in June and July. The leaves of hemlock have a rank smell, of that kind which is called *narcotic* and virose : they affect but little the organs of taste. Taken internally, in no great quantity, this herb has occasioned disorders of the senses, sleep, convulsions, and in some instances death ; and hence it is ranked among the poisonous plants : Boerhaave tells us, that by the *effluvia* of the herb, bruised and strongly smelt to, he became vertiginous. It is said, that to certain brute animals it is innocent, and that its ill qualities are corrected by *vinegar*, or *other vegetable acids*.

The root of hemlock is generally supposed to be, both in external applications, and when taken internally, of more activity than the leaves. Storck relates, that on being cut, it yields a bitter acrid milk, of which a drop or two occasioned a rigidity, pain, and swelling of the part, so as to

prevent speech ; and that he was freed from this complaint, by washing and rubbing the tongue with *lemon juice*.

The cicuta aquatica, at least in our colder countries, is much more violent than the other.

OF CICUTA-AQUATICA.

Long leaved water-hemlock is a poisonous plant greatly resembling *smallage*, growing in many meadows and watery places, for which it has been too often fatally mistaken,

It differs from *smallage* in the leaves being long, slender, and deeply cut, commonly into three segments : those of *smallage* are cut in the same manner, but the segments are short and broad. The roots of this plant are at first hollow, and lined internally with a shining white matter ; by age they become harder and more solid, and change their green colour to a pale yellow ;
when

when full grown they are as large as the fist. They have a number of fibres, like the common celery root, especially at the extremity, by which they are fastened to the earth at the bottom of the water wherein they are commonly produced: they are often, however, loosened and carried off by the water; and too often have been taken up and eaten for celery, of which several melancholy instances have happened. Their poisonous quality resides in an orange-yellow juice, which is distributed indeed through the whole plant, but accumulated most plentifully in the roots.

Wepfer has, in a very learned treatise, described its deadly effects on some children, who by mistake had eaten the roots of it. These were, excessive pain and heat in the stomach; terrible convulsions, with the loss of the senses; distortion of the eyes; flowing of blood out of the ears; the jaws so hard shut that no force could open them; efforts to vomit, but nothing thrown up;

frequent hickups, with a great distension and swelling, especially at the pit of the stomach; and when death had concluded the tragedy, a continued flux of green froth issued from the mouth.

Stalpart Van der Wiel gives the like account of two persons killed at the Hague by the same roots.

In a dog, that, for experiment's sake, was killed by this poison, the stomach, when opened, was found quite constricted, and closed at both orifices; its inward surface red, with livid spots here and there.

Thus it appears, that this plant consists of hot, acrid and corrosive parts, which by rarifying the natural juices of the stomach, and hurting its nerves, are the cause of those terrible disorders, which have been described.

For, upon the sense of a violent irritation and pain, the nervous fluid is, by the mind in a kind of surprize and hurry, determined in great quantities to the affected
part,

part, in order to throw off the cause of the disagreeable sensation : which irritating the fibres of the stomach and muscles of the abdomen, causes vomiting. But when the painful twitching is quite intolerable, the business is over-done ; and the fibres are drawn into spasms, which contract the mouth of the stomach, so that the noxious matter cannot be discharged, but is kept there in continued force and action. And by the communication of the infection through the nervous system, the whole body quickly suffers, the blood-vessels are torn and ruptured by the violence of the convulsions, and blood gushes out from the ears and nostrils, &c

This universal muscular contraction was the reason, that one of the children, attended by Wepfer, made urine in the midst of the agony, to the height of five or six feet, with a strength and violence surprizing to the spectators. The case of the Aconitum is much the same. This is our Na-

pellus or Monks-hood ; and its effects so nearly agree with those now related of the Cicutæ, that I shall not need to recite them ; the experiments of Wepfer are full and convincing.

HYOSCYAMUS OR HENBANE.

The flower is of the infundibuliform kind, consisting of one leaf, divided into several segments at the end. From the cup there arises a pistil, which is fixed in the manner of a nail to the hinder part of the flower. This afterwards becomes a fruit, which is enclosed within the cup, and is like a pot or other vessel with its cover, and is divided by an intermediate septum into two cells, which contain small seeds.

The roots having been eaten by a whole family (thro' mistake) as parsnips, the symptoms produced were : those who eat of them were seized with convulsions in a terrible manner, they were in general speechless, but when they spoke they absolutely

folutely raved ; they had many of them the rifus fardonicus, and all had their eyes flarting as it were out of their heads. The madnefs of them all continued fo compleat, that it was ufelefs to fpeak to them, and the convulfions were fo ftrong, that five or fix perfons were neceffary to hold them, while they had the medicines poured down their throats ; one of the boys efcaping while they were giving the medicines to the reft, ran into a pond, where he would have been drowned, if he had not been immediately taken out. The medicines given thefe people were,

TARTARUM STIBIATUM ;

Forty-five grains in each dofe to the ftrongeft ; and to the others

THERIACA, WITH SALT OF RUE.

They all recovered, but with great difficulty, and with very odd fymptoms at the
going

going off of the heavier effects of the poison. The next day they had all recovered the use of their reason, but had not the least remembrance of any thing that had happened; and all this day every object that they viewed appeared double to them; the next day this symptom was removed, but in the place of this there came on another in the same organ, every thing they saw now appearing red as scarlet. This symptom gradually went off afterwards, and they found themselves perfectly well. Phil. Transf. No. 450. p. 449.

SEEDS of the COMMON HENBANE.

The seeds of the common henbane produce intense thirst, ravings, dimness of sight, and a profound sleep, which may last for two or three days: for which the following is the antidote.

Bleeding, blistering, purging and vomiting, will recover the patient.

O F

OF THE
NIGHTSHADES

BLACK CHERRY NIGHT-SHADE, EGG
NIGHT-SHADE, MAD NIGHT-SHADE,
DEADLY NIGHT-SHADE, DROWSEY
NIGHT-SHADE, PEAR FRUITED
NIGHT-SHADE, AND RIVINA OR A-
MERICAN NIGHT-SHADE.

THIS plant is called, *Solanum Mela-*
nocerafos, *folanum maniacum*, and
folanum lethale. Black cherry night-
shade, mad night-shade, and deadly night-
shade.

Tournefort justly separated it from the
solanums by the name *Belladonna*; and
Linnæus, who preserves the distinction, dis-
carding that unscientific term, has called
it *Atropa*. He adds, as the distinction of
the species, *caule herbaceo foliis ovatis in-*
tegris : herbaceous *atropa*, with oval undi-
vided

vided leaves ; the root is long, thick, and brown.

The stalk is a yard high, purple at bottom ; of a pale green upwards ; thick, hairy, and divided into a few branches.

The leaves are numerous, and placed irregularly ; they are oblong, broad, not at all indented at the edges ; of a faint green, and hairy.

The flowers are very numerous, and singular in their aspect. They rise from the bosoms of the upper leaves, and are hollow, oblong and large ; of a dusky greenish colour, striated and stained in various degrees with a dull purple.

The base within is yellowish, and the upper part purple.

These flowers are succeeded by large beautiful glossy berries, of a fine jet black, and the cup of the flower remains with them.

This

This cup is formed of a single leaf, divided deeply into five segments.

The body of the flower is formed of a single petal, tubular and small at the base, swelled and hollow in the body, and at the edge divided into five little waved segments.

In the hollow of the flower are placed five filaments and a single style: the filaments converge at their bases, and spread out to the top, and they have large doubled buttons; the style is slender, and a little bent, as they are: it rises from a roundish rudiment of the berry, and is crowned with an oblong head, placed transversely; the *berry* contains several kidney-shaped seeds.

The five filaments and single style plainly refer the plant to the pentandria monogynia, the fifth class in the Linnæan method, and its first section.

CUL-

CULTURE OF THE ATROPA.

It grows wild in these kingdoms, and consequently will be hardly in our gardens. The root is perennial, and the berries ripen freely; it may be propagated by parting the one, or sowing seeds from the other; it thrives well in a deep mellow soil. Care is required to cut down the stalks before the ripening of the berries, for they have a tempting look to children; and, if eaten, will destroy them. This plant is poisonous, and is therefore capable of destruction. Many have perished by it.

Of the Use of DEADLY NIGHT-SHADE.

The antients speak of a *folanum maniacum*, or *folanum furiosum*, so named from its effects in producing a *temporary madness*. They have been understood to mean this plant; but there commentators have erred. Mathiolus is with reason to be excepted from

from this censure; for he judged more truly, that it was unknown to them.

Their solanum, whose name was simply the word strychnos, had in a smaller dose the effects of *inebriation*; in a larger quantity it caused *madness*; and in a yet larger death. Thus much Theophrastus says of it. *A drachm of the root given in wine, produced the lesser effect, two drachms brought on the greater, three drachms occasioned madness for life, and four were fatal.* This is the account given by the father of natural knowledge; and this Dioscorides, and those who followed him, transcribed, adding, or altering slightly, according to their particular opinions. From these Greeks the Romans took their accounts. Pliny has jointly used the words of Theophrastus and Dioscorides; and most later writers have copied Pliny. Hence we have the history of the Greek Strychnos, and its *intoxicating* quality, which they called Strychnomania, the *madness* of *Solanum*: and which
modern

modern writers have attributed to the deadly Night-shade. The ancient Greeks knew of three night-shades : the garden kind, which they held innocent ; the sonniferous, which brought on *drowsiness* ; and the *furious* or mad night-shade, whose root in various doses occasioned those different effects. They assert, that a drachm of the root of the *solanum furiosum* might be given with safety ; *but a few grains of that of our deadly night-shade have been found fatal.*

The deadly night-shade therefore is not the *solanum furiosum* of the antients ; nor do their descriptions of that plant agree with it : for that had leaves like the *rocket* or *acanthus*, and clustered berries, as the ivy. The deadly night-shade does not appear to have been known to them ; but it possesses the same qualities in a superior degree ; *a grain of it being equal in effect to a drachm of their strychnos.*

It is capable of bringing on the strychnomania, or night-shade madness ; and when taken inadvertently, is fatal.

On

An infusion of half a grain of the leaf causes vomiting, purging, and sweats.

Effects of this Solanum from the London Magazine for September, 1747.

The following melancholy accident happened at Edinburgh : some boys and girls going into a garden where nightshade grew, and seeing its beautiful black berries, eat several, not knowing their poisonous quality : in a short time they swelled, and were thrown into strong convulsions : next morning one died, and another in the evening, though all possible care was taken of them.

Description of the P L A N T.

“ Solanum Lethale, or Deadly Nightshade, grows wild in several places, such as about ruinous stone dykes or hedges, old buildings, in woods or parks, and in gardens ; it rises sometimes to the height of a man, but usually not above three or

K

four

four feet, having round green stalks set with divers large leaves, smooth, and green, set upon very short foot-stalks, among which, at the joints with the leaves come forth several long hollow flowers, indented at the brims, of a faint, deadish purple, standing in a green husk, which, after the flower is fallen, contains a great, round berry, green at the first, but about September, when ripe, is of a beautiful shining black colour, like polished jet, full of a purple-coloured juice, and containing very many whitish kidney-shaped seeds."

Case of two Boys poisoned with eating the
BERRIES of NIGHT-SHADE; by Doctor
RICHARD LAMBERT.

On Tuesday morning, September 24, 1771, a man from Newburn, in Scotland, in great distress, desired me to visit his two children, the eldest ten years old, the other eight, who the day before had
eat



Deadly Nightshade.

eat of the berries of the deadly nightshade; I saw them at eleven o'clock, and found two fine healthful boys in a very melancholy situation; the elder lying in bed *delirious*, and apparently in a *dying* condition, with strange convulsive gestures; the younger standing at his mother's knees, in his shirt, insensibly rolling his eyes, involuntarily stretching out his arms, and every now and then seeming to pick up something with his fingers, which having thought he had caught, he carried to his mouth, as if he had meant to eat it*; most probably the idea of the berries still remained in his disturbed imagination.

Upon examining the particular state of the case, I found that the boys, the day before, had rambled in quest of black-berries, hips, haws, or other such fruits, as the children of poor villagers usually seek

* *Atropa, belladonna, solanum lethale, deadly nightshade, or dwale.*

for at this season of the year ; that unfortunately they had found this plant, and eat of its berries, as nearly as can be ascertained about three o' clock in the afternoon. At six in the evening, the elder child began to lose his speech, as if drunk ; the same symptoms appeared in the younger, at nine, and both continued the whole night unruly, and were with difficulty held in bed.

Both the children's eyes were amazingly affected ; the whole circle of the lucid cornea appearing black, the iris having retracted itself so entirely, as not to leave the least vestige of the pupil ; the *tunica* albuginea as red as it is often seen in a phrenzy : these appearances, accompanied with a remarkable kind of staring, added to the other circumstances, exhibited a truly affecting scene. It would seem as if this poison, in a very peculiar manner, affects the eyes.

From such an imperfect account as the poor man was able to give, it seemed difficult

ficult to determine at once what might be necessary to do upon the occasion ; so I gave him a common oily emulsion, and ordered him to give each of the children two table spoonfuls frequently, till I could visit them, when I carried with me four papers of vitriol alb. two with fifteen grains in each, the other two with ten grains in each paper ; as I found the children had not vomited after eating the berries, I gave the stronger (and then the younger) one of the papers with fifteen grains, which soon made him sick and puke ; nothing was discharged but a little bile, with froth, and some of the emulsion ; the elder afterwards was given the other two powders, at proper distances, and presently threw up the same sort of stuff. Glysters, made of the materials at hand, were now directed to be injected frequently, in order, as far as might be, to sollicit an evacuation by stool, till proper purgatives could be procured, on which (as nothing of consequence had been

discharged by the vomits) my whole hopes rested. I therefore ordered *two table* spoonfuls of the following purgative.

Take of Senna leaves bruised three quarters of an ounce; cream of tartar one drachm and an half, apothecaries weight; caraway seeds bruised the same quantity. Boil the cream of tartar in half a pint of water till it is dissolved; then pour the water, while boiling, upon the other ingredients, and when cold strain off the liquor for use.

Take of the above infusion seven ounces; dissolve therein one ounce of Glauber's purging salt, and then add one ounce of tincture of senna, or of Daffy's Elixir. Mix them together. And I directed the same quantity of the following emulsion, to be given every half hour alternately, till the children should be well purged.

Take of the oil of the castor nut six ounces, dissolved in the yolk of an egg; add thereto, by degrees, a pint and an half of
water,

water, and sweeten it to the patient's palate. The medicines began to take effect at twelve o'clock that night, the stools appearing purple, like the juice of the berries, intermixed with their black skins; the people say then (as they express it) the children got immediate ease, became sensible and spoke. Their eyes were not quite well till Thursday; and after they were able to walk about, they complained much of giddiness. The purgatives were repeated on Thursday, and both operated well, but produced no discoloured stools.

From this time they continued better and better, and are now perfectly recovered.

Having never heard of any specific antidote particularly adapted to correct the virus of this poison; I concluded the best way would be, as the vomits had failed, to expel it by stool; and was greatly rejoiced, not only to see my conjecture happily succeed in those cases, but to find the practice confirmed by so great an authority as Wepfer, viz.

“It does not seem that the patients lying for some time as if dead, can be ascribed to the coagulation, congelation, or any other corruption of the blood, but rather to a certain convulsive affection of the nerves of the heart, lungs, and diaphragm; because when this symptom went off, and the patients had evacuated plentifully a very foetid faecal discharge, no other ill accidents happened, except that they complained of great weariness. That a portion of the berries of the nightshade was mixed with the blood, cannot be denied, since they were a long while retained in the body; yet the principal part remained in the stomach and intestines; and thence I suspect the symptoms arose, because they soon remitted after a plentiful discharge by stool.” Wepfer, page 291.

RIVINA



Rivina or American Nightshade.

RIVINA, or American NIGHTSHADE.

The root is spreading, and full of fibres. The stem is slender, weak, and edged; but it will run to a great length if supported, and will spread out in a pleasing wildness, into a multitude of scattered branches. The rind is of a greyish brown toward the bottom, and paler in the younger shoots; and the branches generally swell out at the joints where the leaves, fruit, and flower clusters rise.

The leaves are large and handsome, they are supported on short, purplish, hairy footstalks. They are broad at the base, waved at the edges, and sharp-pointed. Their colour is a very light green; but toward autumn they usually grow purplish, and they are naturally a little downy; this is sometimes more, sometimes less, and often scarce perceptible. The flowers are placed in a double series, on long, slender, common

mon foot-stalks. Each flower has, on this common-stalk, its little pedicle; and they are small and inconsiderable; their colour whitish. The berries follow, and are of a fine deep red, and often of a violet purple. This change of colour arises from the culture. The juice of these berries stains with a very glorious colour, but it is not lasting. The flower consists only of a cup, and the parts of fructification. This cup seems part of the body of the flower; which is formed of a single piece divided at the edge into four segments, and in colour white.

Within this cup, in which there are no petals, stand four small filaments, distinctly crowned with their separate buttons. In the centre of these appears a single style, short, and produced from a large and roundish body, the rudiment of the fruit. This, by degrees, ripens into the perfect berry, and the cup remains under it, but changes form and colour; it becomes green, and its segments roll back. In each berry is
contained



Egg Nightshade.

contained a roundish rough seed. The plant is a native of Jamaica, Barbadoes, and the Caribbee islands, &c.

OF EGG NIGHTSHADE, CALLED THE
MAD APPLE.

This plant demands a place among those of curiosity, from the singularity of its fruit, which is of the bigness and colour of an egg. It has been supposed, that being of the nightshade kind, which is thought in general poisonous, and characterised by so singular a name, it had the effect of causing madness; but some say it is an error.

It is truly and properly of the nightshade kind, and its name, according to Linnaeus, is *solanum caule inermi herbaceo, folis ovatis tomentosis integris, calycibus spinosis*. Weak herbaceous nightshade, with oval, undivided, downy leaves, and prickly cups.

The

The plant is two foot and an half high, of an irregular growth, and spreading: the stem is round, thick and hairy; the leaves are large, and they stand upon long footstalks; they are broad at the base, smaller to the point, and irregularly waved at their edges; their colour is a pale green, and they are hairy,

The flowers are not of any great beauty; they are moderately large, and of a dusky white, with more or less of purple. The fruit which follows these is of the bigness of a hen's egg, white, soft, and juicy.

PEAR



*Pear fruited Solanum,
or Barbadoes Batchelor's Pear.*

PEAR FRUITED SOLANUM.

The pear-fruited solanum, its vulgar name is the Barbadoes Batchelors Pear; some, from its fruit having the shape of a breast with its nipple, have called it solanum mammosum: Linnæus names it solanum caule aculeato herbaceo, foliis cordatis quinquelobis, utrinque villosis aculeatis. Herbaceous nightshade with prickly stalks, and heart-fashioned leaves, divided into five parts, and prickly.

It is a spreading plant of a yard high. The stalk is green and round, and it is armed with many strong crooked thorns, the branches spread themselves irregularly, and the leaves stand thick upon them. They are extremely singular and beautiful, each has its separate foot-stalk, and the shape is somewhat like an heart. They are broad at the base, where they are usually indented for the reception of the stalk, and they

they have five principal divisions. Their colour is a strong green, but it is rendered paler by a downy matter that hangs about them; and they are armed on each side with numerous upright yellow thorns. The flowers are scattered over various parts of the plant; and they are not considerable: each is formed of a single petal, which is tubular a little way at the bottom, and formed into five large segments at the edge; and the colour is naturally white, but sometimes dashed irregularly with a dusky purple; the fruit is the conspicuous product; this is said to be of the shape of a pear, but this is an indeterminate word, pears being of various forms; it resembles, in shape and size, a common fig, but grows at the large end to the stalk. Its skin is smooth, and its colour is a pure bright gold yellow. The plant will often have forty of these upon it at a time, and in that case makes a very conspicuous appearance. To know its class, the student must



Proliferous Datura.

must tear open a flower. He will find its inner structure perfectly correspond with that of the egg nightshade : this shews him to what class it belongs, namely, the Pentandria ; and that it is of the first section, Monogynia ; the filaments being five, and the style single among them. It also shews him something more, it justifies Linnæus upon the principles of his own method, for joining that plant with the nightshades.

This plant is a native of the American islands.

PROLIFEROUS DATURA.

Beauty and singularity unite in the flower of this plant, and both in a very great degree. We admire the two in a hose cowslip, and with reason, for the plant is vastly pretty ; but with how superior an attention should we regard this, which, with a colour vastly preferable, is more than forty times its bigness. Let not the botanical reader suppose it a variety of the
common

common thorn-apple: the flower of that is white, and its fruit oblong: this is indeed a variety, but of another and much more elegant species, whose flower is purple, and its fruit round.

Banhine and the old writers describe this in the single state of the flower, under the name of *Solanum pomo spinoso rotundo, oblongo flore*. Some, *stramonium fructu rotundo*; in the elegant variation of which we write here. Alpinus and Vesslingius call it *Datura*. This name Linnaeus adopts for the genus, and adds, as its distinction in this species, *pericarpis spinosis nutantibus globosis*: *Datura*, with round prickly drooping fruit. The root is long, thick, divided, reddish, and of an ill smell.

The stalk is robust and upright, but divided in a very beautiful manner into branches.

It will grow, with good culture, to five feet in height; and spreading its branches
every

every way, will form a round and regular bushy head; which, when covered with its most elegant flowers, disputes the prize of beauty with most of the vegetable kind. The colour of the stalk is naturally purple at the bottom; and upwards also, and throughout the whole course of the branches, its natural pale green has a purple tinge. The leaves are numerous, singular, and not without their beauty: they have a robust footstalk: they are oblong and sharply serrated: their colour is a blackish green; and they have purplish veins. The flowers are very large and elegant; they rise one within another, and are on the outside of a glowing purple, mixed with crimson; and within of a pure and perfect snowy whiteness. This rise of one flower in another is a luxuriance of nature; but 'tis not in many cases the mere effect of culture. This plant is wild about the cape of Good Hope, and it is a native of Africa, and the East Indies. A cup receives the

L

bottom

bottom of this flower, of an oblong shape, tubular, and formed of a single piece, swollen at the bottom, marked with five rising angles, upwards, and at the rim divided into as many segments. 'Tis peculiar in this cup, that it is neither permanent, nor deciduous entirely. It falls, as if cut off horizontally near the base, leaving a rounded piece behind, which adheres to the fruit. The body of the flower is formed of a single petal, and is of the funnel shape; a term used by the botanical writers for many flowers; but there is not one with which it agrees so well as this. It is narrow at the base where received into the cup, and from this part it swells out into a vast hollow. Several ribs run along the body of the flower. Five are most conspicuous; and at the rim it is cut in five places, or, when luxuriant, into many more, but there are five principal divisions. The segments grow narrow toward the point, and end in a kind of crooked tails.

tails. This is the simple flower; and the variety of purple and snow-white render it beautiful enough; but in the most elegant state it is proliferous: another flower rises from within the hollow of the cup; and in shape is perfectly the same with the other. Two, three, or four flowers will sometimes rise from one cup thus one within another. To know the class of the plant, its parts of fructification must be examined; and these are always most distinct in the simplest flower. Let the student chuse such a one; and tearing it open, he will find within, five pointed filaments, terminated by oblong, obtuse, and compressed buttons; and among these a single style, with a top, formed of two plates.

The five filaments shew the plant to be one of the *pentandria*; and its single style declares it one of the *monogynia*: the fifth class of Linnæus, and its first section.

This *Datura* is a native of Africa, and the East Indies.

T H E
T H A P S I A,
O R
D E A D L Y C A R R O T.

THE roots of this plant are long, but not very thick, with many large winged leaves, not much unlike common carrots, but having the segments each set opposite to one another, somewhat rough and hairy; the flowers are small, yellow, and five-leaved, growing in umbels at the top of the stalks, and are succeeded by flat broad seeds, having a thin scaly skin on each side, of an hot taste. It grows in Italy and Spain, and flowers in July; it works upwards and downwards, producing an inflammation of the stomach and intestines; whence a dysentery is occasioned. The same is so highly acrimonious, as to cause convulsions, and then death.

These symptoms are removed by *taking a vomit, and drinking plentifully of vinegar, oil, and barley water.*

T H E



Thorny Sensitive Plant.

THORNY SENSITIVE PLANT.

TH E general name Sensitive, is suited to many species of the Mimosa, with various additions used to express them all ; and with the epithet, thorny, usually applied to this ; which possesses the quality, the term describes, of shrinking from the touch, in greater perfection than many others. Linnæus calls it, *Mimosa foliis subdigitatis pinnatis, caule aculeato hispido*, prickly rough stalked mimosa, with the leaves pinnated, and disposed in a fingered manner.

The English name the *Sensitive plant*, tho' appropriated to this genus in common acceptance, has been given to many others. The quality of receding from the touch being not peculiar to the mimosa, but inherent also in one of the *wood sorrels* very strongly, which thence obtained early the name of the *live plant*, *herba viva* ; and in a less degree in many others. The root is divided into many parts, and hung with

fibres, The stem is round, as thick as a goose-quill, of a brownish colour towards the base, and more green near the extremities; and is beset at distances with small brown, hooked, and sharp prickles. The height is about two feet, and it divides into innumerable branches. The bark in the lower part usually cracks and grows rough, but on the younger shoots it remains always smooth. The leaves are very singular and beautiful. Each is supported on a long tender foot-stalk, which often droops with it, and is composed of five, six, or eight parts, placed in the fingered manner; and each of these is regularly pinnated; the pinnæ, and their supporting ribs, naturally stand all wide expanded, but on a touch with the hand, or only on the motion of the air in an approach toward touching it, they collapse, and, as it were, fade. After remaining so a little time, the ribs rise to their proper places again; and the leaves expand with their first vigour.

The

The flowers are numerous, and they are collected into a kind of round heads, placed on slender foot-stalks at the extremities of the branches. They are of a greenish white at first, but afterwards they acquire a tinge of purple, each has its small cup, formed of a single piece, and divided by three irregular indentings at the rim: this forms the body of the flower, for there is no petal. The filaments are only four, very long, and very slender; and they are terminated by incumbent buttons. In the midst of these rises a single style. The number of filaments in other species of the mimosa is much greater, and refers the student, thus far instructed in the science, to their origin, for finding its class. They rise from the receptacle, and he is therefore to refer the plant to the polyandria; the single style shews it one of the first section of that class, the monogynia. This, if the strict rule of science be observed, does not belong to the same class with them. Linnæus

has, however, placed it among the others, considering the general agreement of parts, as a mark of its being a *mimosa*, although it differs from them in a point so essential. It agrees indeed neither with the established character of the class or genus in which this author has placed it. This plant is a native of the *Brazils*, and with us requires a stove: but with due care it will arrive to full perfection. In favourable summers it will live many months in the open air.

E X P E R I M E N T S.

This plant at noon-day has its leaves raised and expanded. In the night it is not capable of the common motion on the touch, for the leaves are already in the condition whereto they would be reduced by it. In the day they rise and spread: and it is then that the strange effect appears on touching them. Light expands the lobes, separates the ribs, and raises the foot-stalks.

It

It does this by putting all the parts of them into a vibrating motion. That the power of motion in this plant depends upon the effect of light on the expanded surface of the leaves, is certain ; for till they are expanded they have no such power. The young leaves, even when grown to half an inch in length, have no motion on being touched, tho' roughly and suddenly. The analogy between the effect of a sudden motion, and of the absence of light, is confirmed also by this ; for as light decays naturally in the evening, or artificially by shutting up the plant, the leaves first close, and the foot-stalks afterwards fall. The power of absolute darkness is greater in the sensitive plant, than that of the rudest touch. The rudest touch will only cause the lobes of the separate leaves to close, and the foot-stalks to hang down ; the two leaves will remain far asunder. The effect of absolute darkness exceeds this ; for the two leaves also absolutely close together, and it appears as if

if the foot-stalks supported only one. This proves, that the expansion of these parts depends solely upon the effect of light; and that, although it may be disturbed by super-added and ruder motion, yet it can be taken away absolutely only by darkness; by the want of that on which alone it depended. These experiments every one may easily repeat; the observations will be easily made by any who have stoves; they are constant and invariable, and the conclusions from them are certain, for no other cause intervenes. The effect of light is continual while the light continues. The plant, therefore, whose leaves have been thrown down and closed by a rude shock, is immediately affected by the light; for at its first appearance in the morning, or on its admission, when the leaves have been closed by artificial darkness, the vibration instantly begins; and if the light be at its full strength, the expansion and elevation of the lobes is so quick, that one may almost

most look upon the plant and see it. A few minutes often perfect it.

That the touch of the leaves no other way affects them than by a motion greater than their own internal vibration, is plain from this, that if they be touched with a finger in so deliberate and gentle a manner as not to move them, no effect is produced; and on the other hand, if they be any other way moved, the full effect follows. If the pot be shook, though no part of the plant be touched, the leaves close, and their foot-stalks fall: or if the wind blows rudely on them, the effect is the same.

The honourable Sir Hans Sloane, in his observations from *Piso*, says, that the *root of this shrub is an antidote against the shrub itself*, which is very poisonous, and kills by degrees, making the unhappy sufferers cachectical, short-winded, and melancholy till they die.

The

T H E
A M E R I C A N,
O R
C A N A D A F L A T L E M O N T R E E.

THE root of the flat lemon-tree, which grows in Canada, is a deadly and subtle poison, but at the same time a good antidote against the bite of serpents ; it must be pounded and applied directly to the wound. Father Charlevoix, a jesuit, says, this remedy cures effectually and never fails. This tree is so called from its fruit, the lemons have the shape and colour of those in Portugal, but they are smaller, and of a flat taste ; they are excellent in preserves.

T H E

T H E

AMERICAN FLEA PLANT.

TH E same author says, that the American Flea Plant is dangerous, either to touch or look at.

W O L F S B A N E.

TH I S Plant is called *Winter Aconite*, and *Wolfsbane*. The name our gardeners have for it, is the *English* of *Aconitum Hyemale*, by which the common writers express it; 'tis properly a kind of Hellebore. This *Morrison* knew, and named it *Helleborus ranunculaides præcox*: *Linnaeus* and *Van Royen* confirm this determination; and add the peculiar character rising from the place of the flower, as its distinction from the other species, helleborus

borus flore folio infidente : Hellebore, with the flower fixed upon the leaf. This plant is highly poisonous ; and Camerarius says, the root in a small dose is purgative ; tho' in an over quantity it would do mischief. This refers it to the Hellebores, even in quality. The root is tuberous and irregular in form ; blackish on the outside, fleshy, and of an acrid taste.

The whole plant above the ground consists of a leaf raised in a foot-stalk, and crowned in the centre by a flower. Many of these stalks usually rise from the same root ; but all of the like kind and composition, each being a separate and perfect plant. The stalk is round, hollow, smooth, naked, whitish at the bottom, and all the way up more green.

On the summit of this is placed a single leaf. This is not joined to the stalk at its edge, but fixed upon it by the middle, and is of a handsome shape. The general form is roundish ; but it is very deeply divided
into

into an irregular number of long and narrow segments, and these often split again at the ends. The colour is a fresh and lively green, but with some light tinge of yellow.

In the centre of this leaf is placed a single flower. This has no foot-stalk; it is large, and of a beautiful yellow, tinged toward the bottom often with a cast of green. The flower is composed of six petals, broad, oblong, obtuse, and naturally a little bending inwards. There are in the hollow of the flower six nectaria, singular and elegant in their structure. Each is formed of a single leaf, tubular, short, narrow at the bottom, and widening to the top, where it opens inward with a gaping mouth; and the whole six are placed in a circular direction. The filaments which decorate the centre, are very numerous, slender at the top, and crowned with buttons of a particular form. They stand erect, not cross-wise, as in the last mentioned

tioned flower; and they are oblong, compressed, and broader toward the top than at the bottom. In the centre of these rise several styles, of a horned figure, and terminated by thick tops.

The plant is a native of the Alps.

There is another aconite, called blue hairy aconite with a larkspur flower. Wolfsbane, with the Siberian larkspur flower; or Siberian larkspur: as it is common in Siberia.

GREAT

G R E A T D O R O N I C U M,

O R

L E O P A R D ' s B A N E.

TH E root is white, of a singula form, divided into several parts, and spreads under the surface; the principal divisions are jointed, and have a kind of scaly covering; from the lower parts of these run down into the earth a few fibres. The leaves which first rise from the root are supported on tender foot-stalks, and are large, broad, obtuse, and of a pale green; high rib'd on the under side, and covered with a flight and delicate silvery down.

The stalk is thick, but tender, marked like the fluted column of some order, with a number of regular ridges, hollowed between; of a pale green, covered with light
M hair,

hair, a foot or more in height, hollowed, and divided into a few branches. The leaves are placed singly, at considerable distances on this, and are shaped like the head of an arrow. They are broadest at the base, where they surround the stalk more than half, and sometimes entirely; and they become gradually smaller at the end, where they terminate obtusely; they are waved and indented at the edges, of a pale green, with silvery hairs, and they have high whitish ribs on the under surface. At the top of the stalk, and of the branches, stand three or four smaller leaves closer to one another, and from the bosom of each rises a stalk, with two or three buds for flowers, which open in succession. They are large, yellow, and of the radiated kind: they have not the aspect of garden flowers, yet are not without beauty on a near examination. In the bud, the yellow petals are laid together, so as to form a little golden button; over which the segments

ments of the cup, which are much longer, meet in a loose but delicate manner, defending, without hiding, the rudiment of the flower. In a state a little more advanced toward ripeness, the petals open, and shew, tho' still within, the broad rudiment of the disk, formed of pale yellow rising dots. The flower when full opened is an inch and half in diameter, formed of a roundish rising disk, crowded with innumerable floscules, and of a circular series of rays; the whole inclosed at first, and afterwards defended by a delicate pale green cup. The flower is yellow throughout, but the disk has something of an orange tint; and the rays are perfect gold. The stalk swells into a turbinated lump for the support of the flower, and from the head of this rise thirty elegant green leaves, forming a cup, which widens all the way upwards, and is of more than half the length of the rays of the flower when expanded. These leaves are placed in two

series, an outer and an inner ; and they are narrow, swelled at the base, broadest at a little distance above that part, and terminate in a point like a hair ; the leaves of the cup are thirty in number. There are two kinds of floscules which compose the flower of the Leopard's bane.

This Doronicum is a native of Europe.

L A C I

LACINIATED RUDBECKIA,
OR THE
CANADA SUN-FLOWERED ACONITE.

THE root is thick, and beset with many long and large fibres. The stalk is firm, upright, and five feet high; round, but deeply ribbed, and of a strong green. The leaves stand irregularly, at small distances, and they are large. Their colour is a deep green, and they are divided into three principal parts, and those again are deeply cut and jagged. As the whole leaf is large, so are all its parts; and when these segments are notched, as they often are in the larger leaves, these indentings are vast, open, and distant. The whole plant has a slight hairyness. The flowers are numerous, large, and elegant; they terminate the main stalk, and the many branches from the bottom of the leaves; they are of the composite

radiated kind, large, and very beautiful. They are, when full open, about three inches and a half in diameter; and are composed of numerous, long, yellow rays, and a multitude of floscules arranged in a kind of cone, and opening in regular succession from the bottom. The cup is composed of several leaves in a double, triple, or quadruple series; they are oblong, broad, and of a fine green. Besides the general cup, each of the floscules has a kind of small cup, or regular supporting rim from the receptacle.

Immediately within the general cup are placed the rays; these are female floscules, and within them rises the cone of the tubular floscules, which have both male and female organs and are thence called hermaphrodite; the rays are usually fourteen in number, sometimes more, rarely less. They are very long, moderately broad; they are nipped at the end, and naturally hang down. Their colour is a very strong and fine yellow, and
they

they are uneven on the surface, ribbed, and furrowed. The floscules at first appear in the form of so many close green buttons, ranged in a regular manner. The first that open are a ring or series just above the rays, and after this they burst out in succession. When fully open they are hollow, somewhat funnel-shaped, ribbed on the outside, and divided into five parts at the rim. From the hollow of these floscules, burst five filaments with cylindric buttons; and after these have shewn themselves some time, a simple style appears from the rudiment of the seed, whose head splits into two parts, and these turn back.

When the flowers are fallen, a head of naked seeds presents itself in view; this is of a conic form, and is supported by the common cup. The figure of each seed is an oblong square.

YELLOW PYRENEAN ACONITE.

Many authors have confounded this with the common yellow *aconite*. Ray makes a just distinction, and calls it *Aconitum Pyrenaicum luteum foliorum segmentis sibi invicem incumbentibus*. The root has a multitude of long twisted, blackish fibres, connected to a small thick head: the stalk is a yard high, pale, upright, and not branched: several shoots rise from the bosoms of the upper leaves, but they are small and erect; the main stalk runs up single and undivided; the leaves are of a pale, but not unpleasing green; they have long footstalks of a faint green, and hang from them in a palmated form, but with a wild and strange irregularity. Each leaf is divided to the rib into five segments; these are long, narrow, rarely of equal breadth, and cut into deep segments, or at least deeply notched at the edges, and sharp pointed. The lower leaves sometimes have these segments expanded flat and regularly; but the
general

general disposition is much otherwise. The flowers are extremely elegant ; they are numerous, and terminate the main stalk, and all the branches, in a kind of short spikes. Each has its footstalk, and their colour is a very singular pale, and as it were whitish yellow ; their form is properly that of the *aconite* flower. There is no cup ; the body of the flower is composed of five petals, one of which is placed above, two below, and two sideways. The upper petal is tubulated and galeated, inverted or placed with the back upwards, and is obtuse, the head bent back to the base, and pointed : the base, where it is connected, stands opposite to this head. There are two nutaria very singularly disposed ; hid as it were under the upper petal : they are hollow, have an oblique mouth, stand nodding ; and have a crooked tail ; these singular parts are placed on long foot-stalks, slender toward the top. The filaments are numerous, short, and slender ; they

they are broad at the base, and have small upright buttons. In the midst of these stand five styles, rising from as many seed vessels, terminated by simple reflected heads. The fruit is composed of the same number of seed vessels, and each contains several rough angulated seeds. This, and the common yellow *aconite* have five styles, and as many rudiments of fruit; but they are perfect *aconites*, as they agree in all the other characters with the rest of that genus.

This plant is common in the north of Europe.

PROLIFEROUS MOUNTAIN CROWFOOT,

OR THE

PORTUGAL CROWFOOT.

MOST writers in botany have named it, by its proper title *Ranunculus*. Linnæus calls it Crowfoot with ferrated leaves, and single flowers on naked stalks. The root is formed of several oblong tuberous pieces. The leaves spread in a pretty cluster on the ground, and have short footstalks, which are white, with a light tinge of green; the leaves are of a pale agreeable green, and have a few straggling whitish veins. These are very conspicuous on the under side, and the leaves often rise into a kind of soft lumps or tubercles between them. The shape of the leaf is oval; it is a little hollowed in the broad part of the stalk, and grows narrower to a point. The edges are beautifully ferrated. Among these
rise

rise the stalks. They are numerous, slender, of a whitish green, but tinged a little with red towards the base, and about fourteen inches high. No leaves grow on these; each is destined for the support of one flower, and this, in the state of nature, is large, yellow, formed of five petals, with a great cluster of filaments in the centre, and of a light fragrance. Naturally the petals, when the root is well nourished, will exceed the proper number, as in our meadow crow-foot, being sometimes seven or more; but luxuriant art makes them innumerable, and adds the pleasing wonder of a second production. On the top of each stalk, as it rises from the root, appears a green, oval button, tipped with gold: this, as the small stalk rises in height, swells and expands, till by degrees it is, in the full lustre of a double flower, composed of multitudes of narrow and sharp pointed petals in various circular series; and all of a delicate yellow. In the midst
are

are buried some fine threads, with their buttons, which impregnate the rudiments of many seeds, appearing afterwards in an oblong cluster. Sometimes there rises a small stalk, supporting on its top a representation of the first in miniature. The little flower is formed exactly as the larger one, but the colour is fainter; the bottom where it joins the stalk is white; the first series of petals are also white, tipped with green, and tinged with a little yellow; and the rest are of a fainter yellow than those in the original or lower flower.

GOLDEN PROLIFEROUS CROWFOOT.

This, as the proliferous *Datura*, and the Portugal Crow-foot, has a stalk rising from the centre of the double flower, bearing another. The original plant from which this is raised by culture is of *Asiatick* origin. Linnæus calls this species by the name, ternate and alternate leaved crow-foot, with the divisions

divisions all the way in threes, the segments divided at the edges, and with the stalk branched in the lower part. The root is tuberous and irregular, formed of several oblong pieces, with a few thick fibres. The first leaves are numerous, they spread variously from one head, some erect, and others on the ground; they are differently divided according to their growth and size, but always into threes; the segments are oblong, and notched at the edges. The stalk is a foot high, round, of a pale green, somewhat hairy, and tolerably firm. There are two or three leaves upon it, divided in the same manner as those from the root, and slightly hairy: their colour is a pale green, and their substance tolerably firm. The top supports a very large and elegant flower of the bigness of a common rose, of a bright gold yellow, and composed of innumerable petals; from the centre of which rises a slender green stalk, an inch and a half in length, support-

supporting on its summit a smaller flower, perfectly resembling the larger. The natural colour is the plain bright yellow already mentioned; but the same luxuriant culture, which swells the flower to this bigness, enlarges the number of the petals, and sends up this additional offspring. Its character may be traced in the original and simple flower: in that the botanist will find them, as in the common crowfoot of our meadows.

The petals in that are five; they are broad, obtuse, and connected to the receptacle by narrow bottoms; and at a little distance, above this bottom, there is in each a small hollow; this is the nectarium of the flower. In the centre stand numerous filaments, crowned with oblong buttons which appear double; and in the midst of this tuft are numerous very small and reflected stigmata; these have no styles, but adhere to as many rudiments of seeds.

ORIENTAL MEADOW CROWFOOT.

This grows in the remotest part of the East, and appears much like our meadow crowfoot, only this has nine petals, and ours but five: Linnæus calls it Meadow Crowfoot with multiplied leaves, with prickly bent seeds, small toward the point, and with the cups turned back.

The root is composed of numerous long fibres, connected to a small head. The first leaves have long hollowed footstalks, and are large, and divided into a multitude of long narrow segments: they are of a tough substance, and their colour is a greyish green: they are covered with a loose cottony white matter, the stalk is a foot high, upright, round, and divided into a few branches: the leaves stand alternately on this, and resemble those from the root, by their division into numerous, long, and narrow parts: their colour is the same

same whitish green with that of the others, and they are covered with the like cottony matter. The flowers terminate the stalks and branches, and several are supported also on slender footstalks, rising from the bottoms of the upper leaves: they are in the whole numerous; and are conspicuous both in size and colour. They are half an inch in diameter, and of a very fine, though not strong, yellow colour.

The cup is composed of five oval leaves, and these, when the flower is open, turn back, and, hanging downward, shew the hollow of their inside, tinged with the yellow of the flower, though paler.

Five petals form the body of the flower, and these are obtuse at the end, broad, and fixed to the receptacle by small bases. A little above this part, in each petal, there is a small hollow, the nectarium. The centre of the flower is filled with a multitude of filaments, and a cluster of rudiments of seeds, with their heads, placed

N in

in the midst. The filaments are short, and are crowned with doubled buttons. Each rudiment has its separate head fixed to the summit without any style; and when the flower is fallen with its cup, these ripen into so many oblong pointed seeds.

DOUBLE WHITE CROWFOOT, WHITE
ALPINE, or GREAT WHITE MOUN-
TAIN CROWFOOT.

This by art has been brought to a double flower, the same as the other crowfoots. This plant is common in the wilds of *Bohemia*. It is now common in our gardens. Linnæus calls this species, crow-foot, with all the leaves divided into five parts, and those lanceolate and deeply cut and notched. In this he refers to the plant in the single state of the flower, naming the double form, as a variety. Others in its single state have called it the
white

white alpine crowfoot, and great white mountain crowfoot.

The root is composed of numerous thick spreading fibres, which rise as it were immediately from the base of the stalk, without any head. The first leaves are supported on long foot-stalks, and are of a fine deep green. They are divided to the base into five parts; and these are oblong, broadest toward the middle, and sharp pointed; and they are deeply jagged, and notched at the edges; the stalk is round, thick, and branched, two feet and a half high, of a pale whitish green, and often stained with brown. The leaves on this are like those from the root, only smaller, and stand irregularly, and at distances. The flowers terminate the branches, and are very numerous and elegant; they are of a snowy whiteness, and are composed of numerous series of small, curled, and waved petals. This is the state of this flower, when cultivated by the gardener.

The single flower is in all respects, except colour, like those of the common crow-foot of our meadows. It has its little cup of five leaves ; the petals are five, and each has its hollow at the base, the nutarium of the flower : the filaments are extremely numerous, rise from the receptacle, and surround a great cluster of rudiments of seeds ; each of which, though destitute of a style, is crowned with its proper head. These, as we have before observed, are the characters of all the crowfoots, which refer that genus to the *polyandrous* class, and under that head to the last division, the *polygynia*.

BLACK



Black Nettlebore.

BLACK HELLEBORE.

TRUE Hellebore, Rose Hellebore, &c.

Linnaeus calls it Hellebore, with the flower-stalk almost naked, and with the main foot-stalk of the leaf divided into two parts. The root is composed of innumerable, thick, black fibres, long, tough, and variously entangled, rising from a small head, and spreading every way to a vast distance. The leaves are large and numerous, and are divided in that coarse fingered method, called in botany *pedated*. The foot-stalk of this divided leaf is thick, short, and juicy; it usually rises slanting, and is of a fresh green; when the plant is in perfection, it is stained with red, in various and irregular little spots. The leaves placed on its divided top, and forming what is called the entire pedated leaf, are usually nine; they are oblong, broad, of a strong green colour, and of a very firm sub-

stance, indented round the edges on their extreme part, but perfectly entire below ; and often cut out into a small point at the end.

The divisions of the footstalks at the end are always coloured, reddish or brownish ; and in the best condition of the plant, these and the main rib on the back of the leaf are purple. The flowers appear among the leaves, each on its separate stalk, and these scarce longer than those of the leaves : but the size of the flower renders it very conspicuous : the stalk is fleshy, round, of a pale green, and elegantly spotted with crimson ; it is rarely quite upright. There grows no proper leaf upon this stalk, but close under the flower there is a filmy substance, and sometimes below this another. They serve, in some degree, as a kind of defence to the young flower. Nature has denied it a cup, but these films seem to have been given in its place. The flower itself is of the bigness of a single rose, expanded, white, or variously stained with
crimson.



Dark flower'd White Hellebore.

J. Prestwich del.

J. Royce sculp.

crimson. Sometimes the white is perfect, sometimes the red is shewn throughout; but in the most elegant state the two colours are mixed, and as in the apple-bloom, the red is principally on the outside of the flower. In the centre are numerous filaments, supporting yellow buttons, and from the base rise up a kind of horns, which shew their curled tops above the cluster, and are of a pale green. Round about the filaments are numerous open cups, as it were, of a delicate strong green, tipped with gold. There are eight styles or horned tops in this flower.

DARK FLOWERED WHITE HELLEBORE.

C. Bauhine, calls it white Hellebore with a blackish red flower. The root is composed of numerous, thick, long fibres, connected to a small head. The stalk is round, upright, firm, and near a yard high, naturally of a pale green, but often stained with a deep purple toward the ground. The leaves are placed alternately, and

have no foot-stalks, but in some measure surround the stem at their bases : they are very large, long, of considerable breadth, and marked with strong and high ribs, all running lengthways ; the surface of the leaf is rendered very uneven by these, and the aspect is singular, The colour is of a pale green, often inclining toward yellowish and the substance firm and harsh.

The flowers crown the stalk in a vast cluster, reaching a third part of its length ; they are arranged on long common foot-stalks with short hairy ones for every flower ; and their colour is an extremely deep purple, tending to black : singly they are not large, but the vast number of them renders the plant conspicuous, many hundreds being often open at a time. Each flower is composed of six petals, and is placed naked upon the foot-stalk without a cup. Ray considered these as leaves of a cup, not petals of a flower ; and in the common white Hellebore, whose flower is greenish, there is much of that appearance.

The

The petals are oblong, lanceolate, and permanent. In the centre stand six filaments; they are short and crowned with square buttons. Thus far they are all alike; but, upon a nearer examination, there will be found in some, beside these filaments, three oblong rudiments of fruit, crowned with very short styles, with open heads; in others only a faint representation of a rudiment without styles or heads. In the first kind, the three rudiments ripen into three capsules of an oblong compressed form, each containing several flattened membranaceous seeds; in the others the rudiment fades, and comes to nothing. From this distinction of the flowers the class of the plant is known; those with compleat rudiments, succeeded by seed-vessels, are hermaphrodite flowers; the others, with the slight and inconsiderable appearances, which fade without fruit, are male flowers; and as these two kinds grow on the same plant, the class is that of the polygamia monogynia.

O F

O P I U M.

OPIUM is a concrete gummy-refinous juice ; somewhat soft and tenacious, especially when much handled or warmed ; of a dark reddish brown colour in the mass, and when reduced into powder yellow. It is brought from Egypt, Persia, and some other parts of Asia, in flat cakes of irregular masses, from four to about sixteen ounces in weight, covered with leaves, to prevent their sticking together. It is extracted from the heads of white poppies, which in those countries are cultivated in the fields for this use. Kempfer reports, that the heads, when almost ripe, are wounded with a five edged instrument, by which as many parallel incisions are made at once from top to bottom, that the juice which exfudes is next day scraped off, and the

the other sides of the heads wounded in like manner; and that the juice is afterwards worked with a little water till it acquires the consistence, tenacity, and brightness of the finest pitch.

Opium has a faint disagreeable smell, and a bitterish somewhat hot biting taste: watery tinctures of it strike a black colour, with chalybeate solutions, and thus seem to discover some astringency. Mixed with the serum of the blood, they thicken, and render it whitish; and on blood itself newly drawn, they have nearly a like effect. Mr. *Eller* observes, that on examining, with a microscope, blood thickened by a vinous tincture of opium; the nature of its globules seemed to be destroyed; but neither from these, nor any of the other known sensible properties of this drug, can its surprising operation on the human body be reduced. Taken in proper doses, it commonly procures sleep, and a temporary respite from pain, or the action of any stimulating

lating power. The cause of the pain it in many cases confirms or augments; and in not a few it fails even of giving palliative relief. The cases in which this drug is proper or improper will be best understood from a view of its general effects; which, so far as experience has hitherto discovered them, are as follows.

Of the general EFFECTS of OPIUM.

It renders the solids, while the operation of the opium continues, less sensible of every kind of irritation, whether proceeding from an internal cause, or from acrimonious medicines, as *cantharides*, and the most active *mercurials*, of which it is the best corrector. It relaxes the nerves; abating or removing cramps or spasms, even those of the most violent kind, and increasing paralytic disorders, and all debilities of the nervous system. It incrassates the serous humours in the fauces and adjacent

adjacent parts, by which means it proves frequently a speedy cure for simple catarrhs and tickling coughs ; but in phthifical and peripneumonic cafes, dangerously obftructs expectoration, unlefs this effect be provided againft by fuitable additions, as gum ammoniacum and fquills. It produces a fullnefs and diftention of the whole habit, and thus exafperates inflammations both internal and external, and alfo plethoric fymptoms. It promotes perfpiration and fweat, but reftrains all other evacuations, unlefs when they proceed from relaxation and infenfibility of the parts, as the colliquative diarrhæa in the advanced ftate of hectic fevers. It promotes labour-pains, and delivery, more effectually than the medicines of the ftimulating kind ufually recommended for that purpofe ; partly perhaps by increafing plenitude, and partly by relaxing the folids, or taking off fpafmodic ftrictures. And indeed all the preceding effects are, perhaps, confequences of one general

neral power; being nearly allied to those which natural sleep produces. The operation of opium is generally accompanied with a slow, but strong and full pulse, and a slight redness, heat, and itching of the skin: it is followed by a weak, languid pulse, lowness of spirits, some difficulty of breathing, or a sense of lightness about the breast, a slight giddiness of the head, dryness of the mouth and fauces, and some degree of nausea. When given on a full stomach, it commonly occasions a nausea from the beginning, which continues till the opium is ejected along with the contents of the stomach. Where the evacuation of acrid humours, accumulated in the first passages, is suppressed by it, great sickness and uneasiness are generally complained of, till the salutary discharge either takes place again spontaneously, or is promoted by art. An over-dose occasions either immoderate mirth, or stupidity, a redness of the face, swelling of the lips, relaxation of the joints, vertigo,

vertigo, deep sleep, with turbulent dreams and startings, convulsions, and cold sweats.

A N T I D O T E S.

Geoffroy observes, that those who recover, are generally relieved *by a diarrhæa*, or by a *peculiar sweat*, which is accompanied with a violent itching. The *proper remedies, besides emetics, cathartics, blisters, lixivial salts, and bleeding, are acids and neutral mixtures*: Dr. Mead, says he, has given, with extraordinary success, repeated doses of a mixture of *salt of wormwood*, with lemon-juice: these methods contract the relaxed fibres, and by their diuretic power cause a depletion of the vessels.

Of the Chemical Analysis of OPIUM.

Six ounces of opium afforded a volatile alkaline spirit, not very unlike to that drawn from hartshorn, two ounces; of fetid oil, five drachms, one scruple, sixteen
teen

teen grains ; of coal, and of salt, two ounces, two drachms, one scruple, four grains.

CAUSE of the VIRTUES of OPIUM.

The virtues of opium are owing to a volatile *alkaline* salt, intimately mixed and combined with an oily, sulphureous substance : the effects of which we must consider, first of all upon the stomach, and afterwards, when they have passed the *primæ viæ*, upon the arterial fluid itself.

OF THE ACTION OF OPIUM.

The action of opium is very analogous to that of other volatile spirits, only a small portion of it has a force equal to that of a greater quantity of most of them. A long continued use of opium is productive of great relaxation and debility, sluggishness, heaviness, loss of appetite, dropsies, tumors, acrimony of the humours, frequent

frequent stimulus to urine, and *propensity to venery*. On leaving it off, after an habitual use thereof, an extreme lowness of the spirits, languor, and anxiety succeed, which are relieved by having again recourse to opium, and in some measure by spirituous or vinous liquors.

With regard to the dose, one grain is generally a sufficient, and sometimes too large a one: Maniacal persons, and those who labour under violent spasms, require oftentimes two, three, or more grains; though, even in these cases, it is generally more advisable to repeat the dose at proper intervals, than to enlarge it. By frequent use much greater quantities may be borne; the Turks, who habituate themselves to opium as a succedaneum to spirituous liquors, are said to take commonly a drachm at a time; and Gracius says, that he knew one who every day took ten drachms. Geoffroy relates, from his own observation, that while the watery and vinous tinctures

O

occasioned

occasioned quiet sleep, the spirituous tincture brought on a temporary phrenzy. It is said likewise, that alkaline salts diminish the soporific virtue of the opium, that fixed alkalies render it diuretic, whilst volatile alkalies determine its action to the cutaneous pores; and that acids almost entirely destroy its force. Wherefore vinegar, drank in large quantities, is a good remedy to recover those poisoned by this drug. If opium be swallowed, it occasions apoplectic symptoms: in which case bleed freely, and give as an emetic immediately, to children, from three grains to eight, of salt of vitriol, and from a scruple to a drachm, to adults, in every draught of warm water. Apply blisters, and give large doses of the *sal diureticus*, or any other alkaline salt. Gentle *aloetic* purges such as the following, are also very proper in this case.

Take of Rufus's pill and diuretic salt, of each one scruple; elixir of aloes a sufficient quantity to mix the whole into four pills, which are to be swallowed immediately,

ately, and to be repeated as occasion may require.

Or,

Take tincture of hiera picra, one ounce and an half; tincture of jalap, one drachm; mix for a dose.

Or,

Take of the infusion of senna, prepared as directed in page 120, one ounce and an half; tincture of senna, half an ounce; scammony electuary, one drachm; mix for one dose.

EXPERIMENTS made by Dr. MEAD to ascertain the EFFECTS of OPIUM on DOGS.

Having forced into the stomach of a small dog about half a drachm of crude opium, dissolved in boiling water; he quickly vomited it up, with a great quantity of frothy spittle; but repeating the trial, by holding up his head, and beating him, I made him retain three or four doses, inter-

mitting between each about a quarter of an hour. When he had thus taken near two drachms, I watched him about an hour: then he began to sleep, but presently started up with convulsions, fell into universal tremblings, his head constantly twitched and shook, he breathed short and with labour, lost entirely the use first of his hinder legs, and then of the fore ones, which were stiff and rigid like sticks. As he lay snorting, to hasten his end, I was giving him more of the solution; but on a sudden his limbs grew limber, and he died.

Opening his stomach, I found it wonderfully distended, though empty of every thing but some water and *opium*; a quantity of frothy mucus swimming in it; the inside was as clean as if scraped and washed from all the slime of the glands, with some redness here and there, as in a beginning inflammation. The *pylorus* was contracted. The blood-vessels of the brain were very full;

full ; and I took out a large grume of concrete blood from the upper part of it, cutting into the *sinus longitudinalis*, as is not uncommon in apoplectic carcases ; but found no extravasated *serum* in the *ventricles*, nor among any of the membranes.

Generous *wine*, which the ancients gave for an antidote, can be no otherways useful, than as it dissolves the *resinous* clammy part of the *opium* sticking to the coats of the stomach, and so forwards its expulsion by other helps, which cause a contraction of the muscular fibres.

T H E
L A U R O - C E R A S U S,
O R
C O M M O N L A U R E L.

THE poisonous effects of this plant have been long known, by the sudden death of those who have even drank a small quantity of the *simple water* distilled from the leaves, which, for the agreeableness of its taste, is frequently mixed with brandy. Experiments with it have been made upon dogs, which have fully confirmed its fatal effects. Dr. Nicholls gives the following account of the appearances in the animals put to death in this uncommon way. All the dogs fell immediately into totterings and convulsions of the limbs, which were presently followed by a total *paralysis*, so
that

that no motion could be excited even by pricking or cutting them. No inflammation, upon dissection, was seen in any of the internal membranes. The most remarkable thing was, a great fullness and distension of the veins, in which the blood was so fluid, that even the lymph in its vessels was generally found tinged with red.

The same water, injected, as a clyster, into the intestines, had always the like effects, in a very few minutes. A quantity of this water was prepared much stronger than ordinary, by distilling it twice from fresh leaves. By this proceeding he had about a drachm of a heavy oil, of the colour of olive oil, subsiding at the bottom of about three pints of water: this, by frequent shaking, was quite incorporated again with the water.

About two ounces of this killed a middle-sized dog in less than half a minute, even while it was passing down the throat.

There cannot be a more convincing proof, than the effects of this simple water, that all poisons act principally upon the nervous fluid. How surprizing are its effects ! That a simple liquor, without any extraordinary sensible qualities, should even in its passage into the stomach, nay, when thrown into the lower guts as a clyster, instantaneously kill, and that without any marks of inflammation or corrosion, can no other way be accounted for, but by an immediate effect upon the animal spirits.

Animals, killed in this way, after strong convulsions, die universally paralytic ; and a sudden stop being put to the circulation, the blood in the veins remains perfectly fluid.

It seems that the deadly power of this water is entirely owing to its being over-saturated with that *heavy oil*, which this tree contains.

THE ANTIDOTE, AS PROVED BY AN
EXPERIMENT.

To two small dogs, an ounce of strong *laurel water* was given. They fell immediately into most violent convulsions, which were soon followed by a total loss of their limbs. When they seemed to be expiring, we applied to their nostrils a phial of good spirit of *sal armoniac*, and forced a small quantity of the same down the throat; they instantly felt its virtue, and, by continuing the use of it for some time, by degrees recover'd the motion of their legs; and in about two hours, walked about with tolerable strength, and afterwards perfectly recovered.

This antidote shews the nature of the poison, and there is no doubt but the same will prove effectual against any others of this kind, which, without an inflaming quality, stupify, and stop the motion of the nervous fluid.

BITTER

BITTER ALMONDS.

BITTER Almonds are poisonous to animals, particularly to *birds*. In the human body, they act as resolvents and aperients. In emulsion or with sugar they are diuretic, and an anthelmintic; but spirits, flavoured with bitter almonds, have proved poisonous to the human species. It has been experienced, that ten drops of a *red oil* (like to that of the laurel, of a kernelly flavour and taste) distilled in the same manner from *bitter almonds*, (after the sweet oil has been expressed) mixed with an ounce of common water, in like manner, will kill a dog in about half an hour.

K E R.

K E R N E L S

O F

B L A C K C H E R R I E S.

KERNELS of *Black Cherries*, afford by distillation a water, in taste and smell, not unlike to that from laurel, or bitter almonds : which, if drawn off very strong, or over-impregnated with the heavy oil, will certainly cause the like bad symptoms. Some trials have proved this to be so, as it occasions convulsions to a great degree, the very disorder which waters of this kind have been found to produce.

The *yew tree*, *wild cucumbers*, and their juice, are deadly poisons.

Water Crow-foot, if eaten, will cause a loss of understanding, and the muscles of the mouth and lips become so greatly convulsed,
that

that the patient seems to laugh, although he is dying, which is termed the *risus sardonius*.

It is proper to observe, that the poisonous kind of *mushrooms* are distinguished by the under parts of them being either white or yellow, and they generally grow in marshy places.

T H E

THE
MANCHINEAL TREE AND APPLE;

BY

JOHN ANDREW PEYSSONEL, M. D. F. R. S.

FROM

THE FIFTIETH VOLUME OF THE
PHILOSOPHICAL TRANSACTIONS.

THE terrible effects of the tree called Manchineal, are known to all the world: its milk, which the savages make use of to poison their arrows, makes the wounds inflicted with them mortal. The rain, which washes the leaves and branches like boiling oil, causes blisters to rise; even the shade of the tree makes those who repose under it to swell; and its fruit is esteemed a deadly poison. I was informed,
as

as a very extraordinary thing, that a breeding woman was so mad as to eat three of them, which did her very little harm ; and this was looked upon as a miracle, and a proof of the surprizing effects of imagination and longings of women with child. But here is a fact, which will scarce be credited by many persons who have frequented these islands ; which I declare to be true.

One Vincent Bianchi, of Turin in Piedmont, a strong robust man, and an old soldier, of about forty-five years of age, belonging to the horse, was a slave with the Turks eleven years, having been taken prisoner at the siege of Belgrade. He was one day walking by the sea-side ; and, seeing a great number of apples upon the ground, was charmed with their beautiful colours, and sweet smell, resembling that of the apple called *pomme d'apis* : he eat of them without reserve ; he found they had a subacid taste ; and having eaten a couple

couple of dozen of them, he filled his pockets, and came home, eating the rest as he went along. The negroes, who saw him eat the fruit, told him it was a mortal poison ; upon which he ceased eating, and threw away the fruit that was left.

About four in the afternoon, viz. an hour after this repast, his belly swelled considerably, and he felt as it were a consuming fire in his bowels. He could not keep himself upright ; and at night the swelling of his belly increased, with a burning sensation in his bowels. His lips were ulcerated with the milk of the fruit, and he was seized with cold sweats ; but my principal negro made him a decoction of the

LEAVES of the RICINUS * in WATER,

And forced him to drink plentifully of it, which brought on a *vomiting*, followed by

* *Avellana purgatrix* ; in French, *medicinier*.

a vio-

a violent *purging* ; both which continued for four hours, during which time it was thought he would die. At length these symptoms grew less ; and my negroes made him walk and stir about by degrees ; and soon after they were stopped.

Rice-gruel, which they gave him, put an end to all these disorders ; in four and twenty hours he had no more ailments nor pain ; the swelling of his belly diminished in proportion to his evacuations upwards and downwards, and he has continued his functions without being any more sensible of the poison. Sea water, with the juice of limes, and of the fig, and of the white wood tree, are effectual remedies for this poison.

C O C C U L U S I N D I C U S.

This is a little berry, about as big as a bay-berry, but more of a kidney-shape, having a wrinkled outside, with a seam running lengthways, from the back to the navel. It is of a bitterish taste ; and is the fruit of the Natfiatam, bearing leaves in shape of a heart, and bunches of five leaved white flowers, which are succeeded by these berries. They grow in Malabar, in the East Indies.

S Y M P T O M S.

The symptoms which they produce are a *nausea*, *hiccough*, and *anxiety*.

A N T I D O T E.

A vomit, and drinking plentifully of honey and water, removes the complaint.

P

T H E

T H E
AMERICAN ARROW POISON.

MR. de la Condamine mentions a species of poisoned arrows, used by the Indians inhabiting the shores of the river of Amazons, which are similar to those used by the Indians on the coast of Guiana; and the poison with which they are envemomed, probably agrees in its principal ingredients with those which enter the composition of the poison of Woorara, which is so called from a nibbee of that name, which is its principal ingredient. The Accawau Indians, who are here confessedly the most skilful in these lethiferous preparations, use only five ingredients; though the other nations, particularly the Arrowauks, make several whimsical additions, among which are the teeth and livers of venomous snakes, and red pepper, which last may perhaps serve to augment its activity.

The

The following is the recipe by which the Accawan arrow poison is usually prepared.

Take of the bark of the root of Woorara, six parts; of the bark of Warra-cobba cowra, two parts; of the bark of the roots of Cowra-napi, Baketi, and Hatchybaly, of each one part.

These several ingredients are all nibbees of different kinds.

All these are to be finely scraped, and put into an Indian pot, and covered with water. The pot is then to be placed over a slow fire, that the water may simmer for a quarter of an hour; after which the juice is to be expressed from the bark by the hands, taking care that the skin is not broke; this being done, the bark is to be thrown away, and the juice evaporated over a moderate fire to the consistence of tar, when it is to be removed, and flat pieces of Cokarito wood are dipped therein, to which the poison, when cold, adheres, appearing

like a gum of a brown reddish colour. The pieces of wood are then put into large hollow canes, closed at the ends with skins, and in this manner the poison is preserved, until it is wanted to envenom the point of an arrow ; at which time it is either dissolved in water, and the points of arrows dipped in the solution ; or the wood to which it adheres is held over the fire until it melts, and the points of arrows are then besmeared with it. The smallest quantity of this poison, conveyed by a wound into the red blood vessels of an animal, causes it to expire in less than a minute, without much apparent pain or uneasiness ; though slight convulsions are sometimes seen near the instant of expiration.

The poison, when thus inspissated, is liquifiable by heat, and dissoluble in water, in alcohol, in spirit of sea-salt, and in a volatile alkaline spirit, as also in blood, saliva, &c. except only a very small part, which subsides both in spirituous and aqueous
men-

menstruums, and probably consists in earthy particles foreign to the composition ; it unites with acids without emotion, or change of colour. On mixing it with alkalies no ebullition is perceptible, but the colour changes from a reddish brown to a yellowish brown. A few grains mixed with as many ounces of human blood, warm from the veins, intirely prevents a separation of serum and crassamentum, and the whole mass continues united in a state of fluidity, similar to that in which it is drawn, until after some days it putrifies.

How the instantaneous fatal effects of this poison can result from so small a portion, as may be supposed to be left by the point of an arrow immediately extracted, is inexplicable : that it has the power of dissolving the fluids is certain ; but I am far from thinking, that its fatal effects are produced by any such dissolution. The Indians constantly moisten the points of their arrows, when over dry, with the juice of

lemons, which tends to produce an opposite effect ; and blood drawn from the jugular veins and carotid arteries of animals, at the instant of their expiration by the effects of this poison, affords no uncommon appearance, and, after standing, regularly separates into serum and crassamentum, with a greater degree of cohesion, than is usually observed in scorbutic cases ; but yet the animals expired, as it were, by an insensible extinction of their vital flame. Can such instantaneous fatality result from any change in the texture of the fluids, in so short a space ? I doubt whether they are susceptible of it : nor do I believe, that these sudden deleterious effects can arise, except from an immediate injury offered to the sensible nervous system, or the source of the vital functions. Mr. *Herissant* thinks it contracts the vessels ; but says, it does not usually alter the appearance of the fluids, though he once or twice observed the blood to assume a brownish colour.

Against

Against this poison there is no certain antidote discovered ; and its effects are so sudden, that I doubt whether any thing taken by the alimentary passages can act with sufficient celerity to preserve life. Mr. de la Condamine, indeed, says, that salt* ; but sugar more certainly is an antidote for the Amazonian poison ; and sugar, or rather the juice of the sugar-cane, is commonly thought by the white inhabitants of this colony, to prevent the effects of the Accawau poison ; but the Indians themselves do not acknowledge that quality in the cane. Dr. Herissant, however, affirms, that an actual cautery immediately applied to the poisoned wound prevents its effects.

* Salt is not to be found near the river of the Amazons.

FROM THE

CAROLINA GAZETTE, May 9, 1750.

TO THE PRINTER.

S I R,

I AM commanded by the Commons house of Assembly to send you the enclosed, which you are to print in the Carolina Gazette as soon as possible: it is the Negro-Cæsar's cure for Poison; and likewise his cure for the bite of a Rattle-Snake: for discovering of which, the general assembly hath thought fit to purchase his freedom, and grant him an allowance of 100 l. per ann. during life.

I am, &c.

JAMES IRVING.

The Negroe-Cæsar's cure for Poison.

*Take the roots of plantane and wild bore-
bound, fresh or dried, three ounces, boil them
together*

Negro Antidote for Poison.



Black or Wild Hoarhound.

Negro Antidotes for Poison.



Mountain

Golden Rod.



Common

Plantain.

together in two quarts of water to one quart, and strain it ; of this decoction let the patient take one-third part three mornings fasting successively, from which, if he finds any relief, it must be continued till he is perfectly recovered : on the contrary, if he finds no alteration after the third dose, it is a sign that the patient has either not been poisoned at all, or that it has been with such poison as Cæsar's antidote will not remedy, so may leave off the decoction.

During the cure, the patient must live on a spare diet, and abstain from eating mutton, pork, butter, or any other fat or oily food.

N. B. The plantane or hore-hound will either of them cure alone, but they are most efficacious together.

In summer, you may take one handful of the root and branches of each, instead of three ounces of the roots of each.

For

For DRINK, during the CURE, let the Patient take the following.

Take of the roots of golden rod six ounces, or in summer two large handfuls, the roots and branches together, and boil them in two quarts of water to one quart, (to which also may be added a little horehound and saffrafras) to this decoction, after it is strained, add a glass of rum or brandy, and sweeten it with sugar, for ordinary drink.

Sometimes an inward fever attends such as are poisoned, for which he orders the following.

Take a pint of wood-ashes, and three pints of water, stir and mix them well together, let them stand all night, and strain or decant the lie off in the morning, of which ten ounces may be taken six mornings following, warmed or cold, according to the weather.

These

These medicines have generally no sensible operation, though sometimes they give a gentle stool.

The SYMPTOMS attending such as are POISONED, are as follow.

A pain of the breast, difficulty of breathing, a load at the pit of the stomach, an irregular pulse, burning and violent pains of the viscera above and below the navel, very restless at night, sometimes wandering pains over the whole body, a reaching and inclination to vomit, profuse sweats (which prove always serviceable) slimy stools, both when costive and loose, the face of a pale and yellow colour, sometimes a pain and inflammation of the throat, the appetite is generally weak, and some cannot eat at all; those who have been long poisoned, are generally very feeble, and weak in their limbs, sometimes spit a great deal, the whole skin peels, and the hair falls off.

CÆSAR'S

CÆSAR'S Cure for the Bite of a
RATTLE-SNAKE.

Take of the roots of plantane, or horehound* (in the summer, roots and branches together) a sufficient quantity, bruise them in a mortar, and squeeze out the juice, of which give, as soon as possible, one large spoonful; if he is swelled, you must force it down his throat: this generally will cure; but if the patient finds no relief in an hour after, you may give another spoonful, which never fails. If the roots are dried, they must be moistened with a little water.

To the wound may be applied a leaf of good tobacco, moistened with rum.

* Wild, or black horehound.

As

As a Confirmation of the Efficacy of the above Negro remedy for Poison, we shall relate the surprizing Cure performed by that Antidote, on Mr. —, of Dublin, who was poisoned with a mixture of Spanish Flies, or Cantharides, and White Arsenic, in a reddish liquor, resembling Red Port Wine.

On Saturday, March 31, 1770, as I was returning home about 8 o'clock in the Evening, having spent the afternoon with some friends, I met Eleanor Rose, who, pressing me to drink tea with her, which with reluctance I consented to do : having filled a tea-cup, she asked me if I could drink it without cream, as she had none; but recollecting (as she said) a vessel, in which there had been milk, she took the cup and the candle to an inner room to drain the vessel in the tea ; after some time she returned, and laid the cup down, desiring me to drink it,
and

and went back with the candle into the other room ; as I had not any light, I delayed drinking it till she returned, which she seemed to do with reluctance. I was then surprized at the high colour of the tea, and asked her, what she had done to make it so high coloured ? She answered, it was only the strength of it with standing so long, and seemed displeased at my finding fault, saying, do you think that I put poison in it. I replied no, but that I would not drink it, for there was something in it not right. She then took the cup, and sipped the liquor, but spit it out immediately, saying it was like syrup, and that she would drink it herself if it was not so sweet ; and as it was grown cold, she would put some warm tea to it. At length, by many intreaties, she prevailed on me to drink it all but the grounds, which I threw behind the fire : my stomach immediately turned, and my head shook, owing to the disagreeable taste it left on my mouth : I felt an
instant

instant inclination to vomit, with a great sickness. The reaching increasng, I put my finger in my throat, on which I threw up a large mouthful of a nauseous blackish stuff. I then was seized with an unusual tremor, like the cold fit of an ague, and a prodigious cold sweat over my whole body, particularly on my face, also with a violent pain in my breast, and I became so cold, that I was almost numbed, although opposite a good fire. The trembling increased so much, that my knees shook under me, my teeth gnashed, and in a few minutes I fell motionless on the floor; on which she was much frightened, and went out on the stairs, and called one William Martin to her assistance (whom I believe accessory to this business, from what happened after.) On entering the room, they found me in the above melancholy situation, incapable of speaking, and gave me some salt and water, of which I drank plentifully. My bowels seemed as if they were parched,
and

and they finding the shivering continue, put me into bed ; and though all the bed-clothes that could be got was laid over me, yet the shivering continued extremely violent. I endeavoured to compose myself, and at last got a little doze, but shortly after was roused again, by the pain in my belly growing so excessive bad, that my bowels seemed as if tearing asunder, also pains all over my body. These complaints increasing, the intolerable torment I suffered, obliged me to rise at the break of day, the pain made me shed tears, and my belly was now greatly swelled, so that I pressed against the back of a chair for ease. She seeing me in this miserable condition, would have got for me some burned Geneva, which she said was good for a cholic, but I rather chose to take a glass of *Rum*, in which some *Rhubarb* had been steeped with a little saffron, made hot. Accordingly I took a glass of this mixture ; and she said I had a strong stomach, and nothing would kill me.

After

After I had taken this I found myself something easier, and in an hour after the swelling in my belly and pain abated.

April 1. This day I found myself very low and melancholy, which I attributed to my having been much purged by taking the rum, &c. April 2, I took another dose, but not so strong as at first, as I found myself weak, and in the morning inclined to vomit, but could not bring up any thing, though the efforts to vomit were so great as to make the sweat pour off my face. This morning I found, on making urine, that my semen involuntarily flowed from me, of a greenish hue, which alarmed me, altho' I felt no pain (I told her of this, but she laughed, and said, that I had hurt myself by running, &c.) In this manner I continued, growing very weak, and took another dose of rum, &c. which purged me gently, and observed, that the urine I made at night appeared in the morning like the curds of skimmed milk, when boiled,

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and

and my semen still continued to be discharged involuntarily, but not in any great quantity. About three or four days after, the flesh and nails of my fingers appeared as if they had whitloes; and on the 10th of April, the nails of my fingers and toes began to grow black, and the two middle fingers of my right hand in two days after swelled and broke out in blue ulcers, in the middle and upper joints, the first joint of my left thumb and fore finger became also ulcerated; both my hands were stiff and numbed, and a blue blister appeared on the great toe of my left foot. I began now to grow excessive low and weak, and to lose my appetite; my tongue and throat very sore, my gums swelled, with great pain, and the roof of my mouth in small white blisters; the veins under my tongue swelled to a great degree, and the blood almost ready to burst through the vessels, and of a black colour, a difficulty in making water, my eyes itching and inflamed.

I was

I was also restless at night, and unable to lie in one posture for five minutes together; my throat very sore, so that I could not eat any thing but spoon meats, and even with difficulty could swallow liquids, which gave me great pain. The ulcers on the joints of my fingers exceeding sore, which discharged a corrupted matter, mixed with blood, a great itching and foreness, accompanied with a pain and inflammation in my eyes, (which I bathed with rum and water) and from the first time I took the rum and rhubarb, a continual diarrhæa. Finding my health declining, and an entire loss of appetite and spirits, &c. and the other miserable symptoms increasing, and being a stranger to the cause of them, I told Eleanor Rose I would go to a physician, and enquire what was the reason of this alteration in my body and health; which, when she found I was determined on, she and William Martin escaped together (as I was informed) out of the kingdom on the

18th of April, and in my absence, at the same time, robbed me of every thing they could carry off. The symptoms rather increasing I was in a desperate situation, greatly emaciated, with a sensible pain in my breast, a hard lump internally in the right side of my belly, attended with a pricking pain, a copperish taste in my mouth, and at times a dizziness in my head. Sunday April 22, my eyes very heavy, itching and sore, and my colour changed from ruddy to yellow, as if I had been afflicted with the yellow jaundice; walking out to see what the air would do for me, I met a friend, who was surprised at the great alteration in me, and said, if I chose it he would carry me to a surgeon of his acquaintance. I consented, and he examined my mouth and throat, which gave me great pain; he told me my mouth was full of white blisters, and my throat ulcerated, and declared from the appearances, that I had taken some poison, which he believed was Cantharides, from
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the symptoms which I laboured under. He ordered me to gargle my mouth and throat with Barley-water, sweetened with Honey of Roses, to drink of the best Wine, and to come to him the next morning. On leaving him I went to my parents, and acquainted them with my melancholy situation, who immediately sent me to Doctor Lucas, who examined my throat, fingers, &c. and having informed him of the several particulars, as recited in the former part of this narrative, he declared I had been poisoned with Spanish flies (or cantharides) and some mineral poison mixed with them, and that, had I not been fortunate enough to throw up that nauseous mouthful the first night, and take the rum, &c. next morning, I should have died in 48 hours. He ordered me the following Electuary, viz.

Mithridate, half an ounce ; Virginian Snake-root, and Contrayerva-root, of each two drachms ; Chosen Rhubarb, one dram ; Syrup of Saffron, a sufficient quantity

to make an electuary, the bigness of a nutmeg to be taken three times a day, viz. morning, noon, and at night going to bed; to ride in the morning, and drink new milk from the cow, and after dinner to drink a pint of wine. This day I was very ill, the ulcers on my fingers very bad, my tongue, mouth and throat very sore and painful, a constant reaching to vomit, excessive pain in my bowels, and foreness on the right side of my belly, the involuntary emission of *semen* in *coagulated* lumps still continuing, my hair falling off, the palms of my hands full of white small spots, the skin breaking in several places, a great dizziness, at times, a loss of sight for some seconds, and a total chilliness all over my body, my skin discoloured with red, blue, green and blackish little round spots, my teeth soft like horn.

April 24, I took the electuary, the effects of which were, a great evacuation of high-coloured fetid urine, slimy stools, and
profuse

profuse sweats, so great as to wet the bed and bed-cloaths, which were obliged to be dried every day; the torment I endured in the night, continued inexpressible, from the violent pricking pains in my bowels, my gums swelled and inflamed, and discharging therefrom blood and water of a copperish taste, and intolerable pains in my breast. My pains were always violent at night when in bed, for in the day I scarcely felt any pain, except the excessive chilliness which I have already mentioned.

In this desperate situation I laboured upwards of five months, seldom sleeping in the night, but watering my pillow with tears.

I continued to take the electuary, and in some time found myself rather better, as the ulcers began to heal, but the other symptoms still continued, and my weakness increased. The doctor finding my case so desperate, (after my taking nine pots of the electuary) told me I must have a

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person

person of skill to assist him, as my situation required the utmost care to preserve my life, as by this time I threw up from my lungs lumps of a black slimy nature. N. B. This symptom continued till I took the Negro Cæsar's medicine. I then applied to one Mr. Doyle, a surgeon, whom I informed what I had taken by the direction of Dr. Lucas; he seemed sensibly affected with my desperate case, assuring me, that no care of his should be wanting to save my life. He ordered me a dose of *Glauber salts*, to be taken the next day; and the day after wrote the following prescription for me, which was made up by Mr. Pannel, apothecary, in Capel-street, Dublin.

R Mixtur. mercurial. gummos. et balsamic. Capt. Cochlecare mane et nocte *; of which I took a spoonful morning and night for eight or nine days, which entirely healed the ulcers, only leaving

* This, as we suppose, was a mixture of equal parts of a solution of quicksilver in mucilage of gum arabic, and of the common pectoral emulsion.

blackish

blackish marks, which next turned blue, and in time red. The medicine purged me severely, with slimy stools quite white; he then gave me another dose of *Glauber salts*; I now began to mend surprizingly, and was ordered to take the following decoction to heal my bowels, viz.

A good quantity of Comfrey root, boiled in new milk. To take one pint as warm as possible, morning and night.

Having still a great dizziness in my head, so as to make me ready to fall, and a dimness in my sight, at times for about half a minute, he ordered me to *bathe* in the *sea*.

The first of Sept. the same gentleman gave me some nervous pills, two to be taken at night and morning, also an *electuary*, much the same as that prescribed by Dr. Lucas, but with the addition of the absorbent powders; also the following decoction, viz.

Fumitory boiled on whey.

To be drank a pint fasting in the morning, and the same at going to bed. This,
with

with the pills, removed the giddiness and loss of my sight, excessive sweating at night, and soreness of my gums, for which he prescribed a dose of *Glauber salts*, and advised me to chew *rhubarb* constantly; this, and bathing in the sea, I continued until the latter end of September; when beginning to grow restless at nights, especially as soon as warm in bed, and all my former symptoms to return, I was ordered the following infusion, viz.

Lime water, three quarts: *Lignum Vitæ*, four ounces; *Liquorish* root dried, two ounces.

To drink half a pint going to bed, and in the morning; still evacuating involuntarily my semen in small coagulated lumps, and finding no benefit from this infusion, I was ordered to chew *rhubarb*, and drink a decoction of *Sarsaparilla*, *Gentian* root, and *Lignum Vitæ*.

Finding no benefit, but growing restless at night, and my symptoms returning,
also

also my hair falling off again my hands and arms when cold, which was generally attended by a trembling, my skin being mottled with blue and black spots, I was much alarmed; and being advised to try the Negro Cæsar's cure to expel poison, I did so, strictly observing the rules enjoined.

October 14, I began taking the Negro medicine. The effects were, this day, three stools of a pure white slime, and a great discharge of red urine, which smelt like burnt rags, but I slept better this night than I had done before; after the third dose I found an entire alteration for the better. My mouth and gums were healing; the pain in them, my breast, and my bowels gone. I now began to sleep as well as ever, and came to my appetite amazingly. Finding so great benefit by it, I took the medicine again, but it did not cause so great an evacuation of urine as the first time, and my stools were not so severe; this I imagined to proceed from the *golden rod,*

rod, which I now used, being of a different kind; this being the garden kind, with long leaves like a broad grafs; and the first was the mountain kind.

On the 24th of March I repeated the Negro medicine, having perceived some signs of a return of my complaints, making use of another kind of golden rod, with leaves like sorrel, the plant grows high, and is of the garden kind; this proved a more powerful diuretic than either of the former, but I look on the mountain kind to be the best. From the time of my swallowing the poison, to my taking the negro antidote, the second time, I had a continued looseness, which reduced me to a skeleton; and from my first taking that medicine I began to recover, and daily gathered strength, health, and spirits; for which I thank God, who by his providence rescued me from the death, by which the most villainous of women attempted to destroy me, in this most cruel and tormenting manner.

The

The following account of the Indian poison, and the method of curing the terrible symptoms which result from it, is translated from a manuscript of Dr. Isaiab Burgefs, who practised phyfic many years in the Indies, and consequently had the best opportunity of acquiring the secret.

The Negroes and Indians use a poison of a strange extraordinary nature; the dose is very small, it has no ill taste, so that mixed with meat or drink it is not perceivable; it causes divers symptoms, and the effect is various, according as the dose is large or small; it kills sometimes in a very few hours, sometimes in some months, and, at others in some years; the symptoms are according to the quantity given; if great, it causes evacuations upwards and downwards; of excrements first, then of the humours, and lastly of blood, with fainting fits and sweatings. Death ensues in six or seven hours. The negroes change of a white colour.

If

If the dose be but small, the sick person loses his appetite, feels pains in his head, arms, and limbs, a weariness all over, foreboding in his breast, and a difficulty of breathing, languishes, and at last dies.

All remedies, yet publicly known, are of no efficacy against this poison, and the miserable patient certainly dies. Nay, I question whether the best cordial remedies can put the least stop to the efficacy of its venom, or retard death longer, than the time fixed by the artful poisoner from the largeness of the dose.

I am not ignorant, that the *Spaniards* are acquainted with this very poison, having seen several *Buccaneers* die of it, to whom it had been administered by *Spanish women*.

I am also persuaded the same poison is used in Spain and Italy.

This poison has but one specific antidote yet known, the knowledge of which cost me very dear ; and it was with much difficulty

ficulty I could persuade a famous negro poisoner to part with his secret.

CURE OF THE INDIAN POISON.

The antidote is the root of the *sensible plant*, as it is commonly called, or herba sensitiva. It grows like a shrub, has no prickles, flowers yellow, and bears little cods, full of small black pretty seeds, of which the Indian women make necklaces and bracelets. Use none of the root, but what is under ground; wash it well, and split it in two. Take a good handful of these roots so split, and steep them in three quarts of wholesome clean water, in an earthen glazed pot, having a cover. Apply but a moderate fire, that it may boil very gently. The decoction has no ill taste, and you may either take it so, or add sugar, as you shall think best. Give the patient a good glass of this decoction, as warm as he can drink it; an hour after give him another,

another, and so for some time, as you shall think it necessary to make a perfect cure. There is no danger of giving too much, it can do no harm. Several people have taken this decoction, though they have not been poisoned, thinking it would relieve them from other distempers; so that one who suspects he has had some of that poison given him, may drink it very safely, and in what quantity he pleases. The rest of the plant is to be rejected as bad and noxious.

The Doctor enforces his observations by remarking, that he had been a practitioner in these parts for above twenty-five years. Many negroes, he says, were wonderfully preserved and cured, by taking of this antidote, though, for brevity's sake, he gives but one instance, which is of a strong negro man about thirty years of age, and in perfect health, who, being one night at a plantation, four miles distant from that where he lived, was invited to drink a dram
of

of rum, by another negroe, who mixed poison with it. The fellow drank it up, perceiving nothing unusual in it, but as he was taking leave, on the other's bidding him farewell, and telling him he should never see him again, he suspected he was poisoned; and, putting his finger in his mouth, vomited up great part of the poison, though there still remained enough to cause continual evacuations upwards and downwards, of excrements first, then of humours, and lastly of blood. As he was coming home, he fainted away several times, and calling at length at some neighbouring negroe houses, was brought home extremely altered, having turned white, and being thought to be expiring. The root was immediately sent for, and the decoction made, and given him in great quantities. He continued taking it for three or four days, and on the fifth went to work along with the rest of the negroes.

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Thus

Thus far, the ingenious author:—and we must observe, that the sensible plant is endowed with the property of resisting poison.

For the honourable Sir Hans Sloane, whose writings will always remain an honour to his country, has observed from Piso, “ that the root of this shrub is an antidote against the shrub itself,” which is very poisonous, and kills by degrees, making the unhappy sufferers cachectical, short-winded, and melancholy, till they die. This greatly corroborates what our author has advanced, and it is observable, that Sir Hans Sloane likewise directs all parts of the plant, except that part of the root which is in the ground, to be rejected as noxious; though, whether this be exactly the same plant with that which our author mentions, I dare not determine, as Sir Hans Sloane enquires, whether it be not the *æschynome*, seu *mimosa arborescens Americana*, &c. flore albo; whereas Dr. Burges expressly
says,

says, that it flowers yellow; though this may possibly be a mistake in him.—I am sensible it may be objected, that the negroe poison may be of various kinds; and that therefore this remedy, though so extraordinary a specific in some cases, may be unavailable in others. That the negroes may have the knowledge of different sorts of poison, I deny not; but from the universality of the effects of this medicine, as the Doctor affirms, that many have been wonderfully cured and preserved by it, and does not mention a single instance of its miscarriage, it appears as if the negroes in the West-Indies use but one kind of poison; or if they use different kinds, yet such only which come within the power of this remedy. Besides, as we cannot be assured, but by the consequence, whether the poison be of such a sort, as to be within the reach of this remedy, or not, I think there is all the reason in the world, it should be administered under any suspicion of the Indian poison, especi-

ally as the Doctor assures us of its extreme innocence; and I believe every one will readily agree, it is no small recommendation of a medicine, that whatever its good effects may be, it cannot possibly do harm.

THE CARUNA NUT.

The *Caruna*, as it is termed by the Indians, says Mr. Bearcroft in his description of Guiana, is the poison nut of a small tree, or shrub, covered with a thin brown bark, and having small, oval, light green leaves. From the extremities of the branches arise several reddish coloured blossoms, which are afterwards succeeded by the nuts. These nuts, deprived of their external husky teguments, appear in the form of the American anacardium, being about ten lines in length, five in diameter in the middle, and four near each end, where they bend somewhat inwards. Each nut has a large brown shell, consisting of four pieces, which are joined laterally and longitudinally,

nally, but the circular longitudinal juncture is considerably nearer to the one end than the other, and thereby affords room for a cavity towards the end, which is farthest from this juncture. Within this cavity is contained a farinaceous, somewhat oily kernel, equal in size to that of an hazle-nut. The substance of this kernel is a slow but most fatal poison, and is said to be a principal ingredient in the composition of a white farinaceous poison, in the hands of the *Accawau* tribe, which they sometimes conceal under their nails, at their meetings, when they intend to revenge an injury, until an opportunity offers of putting it into the drink of the destined victim of this secret and slow, but fatal vengeance.

ANIMAL POISONS.

The BITES of MEN in ANGER, and MAD
ANIMALS.

CANINE MADNESS, of which the
HYDROPHOBIA is a symptom.

BITE of a RATTLE SNAKE.

— VIPER.

— SCORPION.

— SCOLOPENDRA or CENTIPES.

— The SPIDER of APULIA.

— The SPIDER NHAMDU.

— STING of a BEE.

— — — ASPES.

— GECCO, or INDIAN LIZARD.

— SERPENT COBRES de CAPELLO.

POISON of a TOAD.

CANTHARIDES.

A Species of CATERPILLARS of the
FIR-TREE.

OF

ANIMAL POISONS.

THE venom which is communicated by the stings or bites of animals, chiefly owes its origin and nature to a violent affection of the mind, such as extreme and continued anger: for such is the nature of the passions of the mind, that they affect the nervous fluid, and by that means the whole compages of the nerves and membranes, and greatly prevent all the vital motions of the solids and fluids, as well secretory as excretory, in which the force or effects of a real poison are contained. Hence it appears, that there is no difference between a poison and a violent passion of the mind, as to their efficacy, force, and effects. Thus we have instances of the bites of men in anger being fatal; and I have read of one in particular that was at-

tended with purple spots, convulsions, and a delirium, which ended in death. The venom of animals, whether in a rage or madness, communicates an infection not only by the saliva, milk, and lymph, but by the semen, whence women have received the contagion from their husbands, of which Hoffman says, he knew one remarkable instance.

Of

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CANINE MADNESS.

THIS disease is most frequent after long, dry, hot seasons ; and such dogs as live upon putrid stinking carrion, without having enough of fresh water, are most liable to it.

When any person is bit by a dog, the strictest enquiry ought to be made whether the animal be really mad. Many disagreeable consequences arise from neglecting to ascertain this point. Some people have lived in continual anxiety for many years, because they had been bit by a dog which they believed to be mad ; but, as he had been killed on the spot, it was impossible to ascertain the fact. This should induce us, instead of killing a dog the moment he has bit any person, to do all in our power to keep him alive, at least till we can be certain whether he be mad or not.

Many

Many circumstances may contribute to make people imagine a dog mad. He loses his master, runs about in quest of him, is set upon by other dogs, and perhaps by men. The creature, thus frightened, beat, and abused, looks wild, and lolls out his tongue as he runs along. Immediately a crowd is after him; while he finding himself closely pursued, and taking every one he meets for an enemy, naturally attempts to bite him in self-defence. He soon gets knocked on the head, and it passes currently that he was mad, as it is then impossible to prove the contrary.

We may easily distinguish a dog to be mad by his dull and heavy look, by his endeavouring to hide himself, and seldom or ever barking; and yet he is angry and snarls at strangers, and fawns and leaps on his owner; by his refusing meat and drink, his drooping and hanging down his ears and tail, and lying down as if going to sleep; this is the first stage
of

of madness, which is dangerous, though perhaps not so infectious.

Soon after this he begins to breathe quick and heavy, lolls out his tongue, flavers a good deal, and foams at the mouth; looks half asleep, flies suddenly at the by-standers, and runs forward in a curve line. —

These symptoms increase, and he knows not his owner; his eyes are thick and dim, and water, like tears, runs from them; his tongue is of a lead colour; he grows faint and weak, and often falls down; then rises and attempts to fly at something, grows mad and furious. This is the last stage, in which he seldom lives above 30 hours. The nearer the dog is to this state, the more dangerous is the bite, and the more direful its effects.

The smallest quantity of this saliva either fresh or dried, or in any way communicated, has produced the disease, with all its frightful symptoms. It may sometimes lie dormant; but is brought into action, with great fury, after some time.

Two other circumstances which Boerhaave has omitted are, 1st, that all other dogs, on smelling the dog going mad, will avoid him, and run away with signs of horror. Secondly, that the dog's voice, when he barks, will be quite altered from the natural tone, and seem hollow and hoarse. And though, as the same author observes, the dog may be mute in the dumb madness; yet it is more frequently found, that a dog, especially if confined, shall bark for a day or two together without ceasing.

A certain experiment, to ascertain whether a dog that has been killed was really mad or not.

When a dog is killed upon suspicion of being mad, without an absolute certainty, rub a piece of dressed meat on the teeth and gums of the dead dog, and when this is offered to another dog, if the dog which was killed was mad, the other will refuse it with great terror, otherwise he will eat it.

The

The symptoms attending the bite of a mad dog.

There is no poison known which produces such terrible effects, as that communicated by the bite of a mad animal; nor which induces such a change in the person who receives it; or which rages with such violence, and so suddenly, when it once begins to act.

The part bitten first begins to be painful, then come on wandering pains, gradually, with an uneasiness and heaviness, disturbed sleep, and frightful dreams, accompanied with tossings of the body, sudden starting, and spasms, sighing, a love for solitude, and anxiety.

These symptoms continue through the whole course of the distemper, increasing daily, with the addition of a difficulty in breathing, horror, violent agitations on the sight of water, or other kinds of liquids, or on seeing a looking-glass) great tumor, and loss of appetite. They can swallow any thing which is soft and solid;
but

but when their lips come in contact with a fluid, they start back in the greatest fury and agony; they vomit a bilious matter; a fever, with great heat, comes on, attended with a continual watching, sometimes with a priapism; the tongue becomes dry and rough, and often lolls out of the mouth; the voice becomes hoarse; the thirst is very considerable, and yet they cannot drink; or even bear the approach of any liquor. This symptom is not peculiar to canine madness alone. They endeavour to spit at the by-standers, even involuntarily, with a desire of biting those they can come at; and yet have sense enough to beg they would keep from them, for fear of an accident of that kind; they rage and foam at the mouth; they cannot bear to see a person dressed in scarlet clothes; their pulse sinks, and their breathing fails, and cold clammy sweats come on, with convulsions, which finish the melancholy tragedy.

A N T I D O T E S.

The wound should be immediately enlarged, or entirely cut out; then apply a cupping-glass, with scarrifications; after which cauterize the wound, washing it daily with salt-water and vinegar, or salt dissolved, and keep it open with escharotics. Some prefer rubbing the wound daily with the strong mercurial ointment.

Bleeding is recommended by many to eight or twelve ounces; but that is not necessary, unless the patient be of a plethoric habit.

Emetics may be very proper; and at night, take of the best musk, sixteen grains; of native cinnabar finely levigated, half a drachm; of the saponaceous pill, eight grains; camphor six grains; mix the whole into a bolus, with balsam of Peru, which is to be taken at night going to rest.

Early the next morning, take of the infusion of fenna, three ounces; tincture of fenna,

fenna, half an ounce ; Glauber's purging salt, three drachms ; solutive syrup of roses, two drachms ; mix into a draught for one dose.

The same evening, or the next day, let the patient go into a cold bath, or be dipped in the sea, then be rubbed dry, and put to bed, repeating the musk bolus, with lbs. of an infusion of valerian and saffrafras, with as much warm small white-wine whey as he can drink, to encourage sweating. — This should be repeated, together with bathing, &c. successively for four, six, or seven nights, if the animal was raving mad, and for three or four nights at the next full moon, and the change. The morning after this course, order the cold bath and friction ; and then the patient may follow his ordinary vocations, taking care only that he gets no cold.

In case the Hydrophobia, or dread of water, has seized the patient before assistance has been had, bleed almost *ad deliquium animi* ;

animi ; then proceed in the above method, enlarging your dose of opium to the quantity of two grains, and apply a galbanum plaster, with ʒss of opium to the fauces ; this must be repeated or lessened, as occasion requires. Mercurials have been strongly recommended, as efficacious in this melancholy disorder, and, in my opinion, not without the appearance of reason. As the following receipt has something remarkable in it, I have thought it may be useful, to give it a place in this work. The original receipt is in Cathorp church in Lincolnshire, from which this is taken. The whole town being bitten by a mad dog ; all who took this medicine did well, and the rest died mad.

For the Bite of a MAD DOG.

Take the leaves of rue, picked from the stalks and bruised, six ounces ; garlic picked from the stalks and bruised, Venice treacle, or mithridate, and the scrapings of pewter, of each four ounces : simmer these

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over

over a slow fire, in two quarts of strong ale, till one pint is consumed; then keep it in bottles stopped close, and give of it nine spoonfuls to a man or woman, seven mornings together, fasting; and six to a dog. This, the author believes, will not (by God's blessing) fail, if it be given within nine days after the bite of the dog. Apply some of the ingredients, from which the liquor was strained, to the bitten place.

Boerhaave affirms, that, in general, there is no certain preservative against this disorder yet known; and that there is no example that can be depended upon, of any one having been recovered, who was once so far gone as to dread water.

His directions are, first, that as soon as the poison is received into the body, the part affected, and those adjacent thereto, should have deep scarifications made in them. Then large cupping-glasses to be applied, or the part to be burnt pretty deep with the actual cautery, and afterwards kept in
 continual

continual suppuration. During the whole of this time, the part is without interruption to be fomented with a pickle of sea-salt and vinegar. Secondly, the cloaths, &c. which have come near the person to be thrown away. Thirdly, the patient is, immediately after receiving the misfortune, to be thrown headlong into the sea, or some river, with threatening words, and other circumstances capable of striking terror into him; for which purpose he is frequently to be immersed in the water, and again taken up; for the good effects are only produced by the dread and consternation into which the mind is thrown. He is frequently to be purged with rhubarb, agaric, and the juice of elder bark. Fourthly, let the patient have a gentle sweat excited every morning before eating. Fifthly, his feet and hands are to be daily fomented in a bath of water. Lastly, let him frequently drink cold water, till he vomits it up; and use acidulated liquors often; his diet

must be moist, light and laxative ; he must abstain from large quantities of aromatic substances, wine, &c. violent exercise of body, and all commotions of mind.

The cure is principally to be attempted in the first stage, or beginning of the second. It seems probable, that the following method may be of some efficacy, especially as it is confirmed by some few experiments. Immediately upon the signs of approaching madness, the case is to be treated as extremely inflammatory ; wherefore a large quantity of blood must be taken away by a large orifice, even till the patient is faint ; then directly inject nitrous clysters, mixed with a little vinegar. Let these be repeated boldly, and more frequently than is consistent with prudence in other cases. After this the eyes are to be blindfolded, and the patient thrown into a pond, or cold water thrown upon him, till he be no longer afraid of it. Then let him be immediately forced to drink a large quantity of
water ;

water ; and toward the evening of the same day let sleep be procured.

There is an account of remedies for this malady in the Philosophical Transactions ; one of which is the Lichen cinereus terrestris, or ash-colour'd ground liver-wort, which has been taken into the college Dispensatory, under the title of Pulvis Antilyssus, and is the celebrated remedy published by Dr. Mead, with some variation in the proportion of the pepper. The directions, as made public, are, first to take away nine or ten ounces of blood ; and then take of powdered ash coloured ground liver-wort, four drachms ; and of the powder of black pepper, two drachms : mix these together, and divide into four doses ; one of which is to be taken fasting for four days successively, in half a pint of tepid cows milk. After taking these four doses, the patient is to be put fasting every morning for a month, either into a cold bath, cold spring, or river, remaining therein with his head above water,

ter, not longer than half a minute, if the water be excessive cold ; then let him bathe thrice a week for fifteen days.

Boerhaave tried what effect mercury would have upon animals under canine madness ; and from several experiments, he found it proved successful, by administering some grains of Turpeth mineral, made into boluses. He also mentions the remedy which M. Default tried, with constant success, in the Hydrophobia, which is a mercurial ointment, made of one-third part of mercury revived from cinnabar, one-third part of human fat, and as much of hog's-lard. One or two drachms of this ointment at a time should be rubbed by intervals, or successively, upon and about the wound. As a farther confirmation of the efficacy of mercury in canine madness, it is not improper to take notice of a medicine, brought Mr. Cobb, of Buffalton, near Bristol, from Tonquin, which is much cele-

celebrated in the East Indies, as efficacious in this distemper.

THE TONQUIN REMEDY.

Take of native and factitious cinnabar, of each twenty-four grains ; musk, sixteen grains, powdered and well mixed together. This powder is to be taken all at once in a tea-cup of arrack, which is said to secure the patient for thirty days ; after which time the dose is to be repeated in the same manner ; it should be done as soon as possible after the bite is received ; but if the patient has any symptoms of the disease, the second dose must be repeated three hours after the first ; and this is said to be sufficient for a cure.

Mead recommends the wound to be kept open, and enlarged, and to be dressed with ung. basilic. nig. adding to it a small quantity of red mercury præcipitate as a digestive ; as it happens in most cases, that the wound

being small, is healed before the patient seeks for help.

The surest remedies in all ages against animal or vegetable poisons, have been such as provoke a great discharge by urine. Now as it is remarkable, that Dr. Mead's antidote is a powerful diuretic, and that the following possess the same remarkable qualities, I have introduced them upon rational grounds of their being efficacious.

First, The ashes of the river crab, prepared by burning the fish alive upon a copper-plate, after the rising of the dog-star, when the sun is in Leo, and on the tenth day of the moon, with a fire made of the cuttings of twigs of the white briony, or tendrils of the white vine.

This as Galen avers (in his book de simpl. med. facult. l. ii. c. i.) no body ever made use of without success; and before him Dioscorides (in his Treatise De Theriac. c. ii.) has asserted, that it is a medicine
which

which might be relied on. This calcined powder was given in large quantities, viz. a spoonful or two every day for forty days together; either alone, or rather mixed with a small portion of gentian root and frankincense.

The second is the *spongia cynorrhodi*, vel *rosæ sylvestris*, the sponge of the dog-rose, which is so celebrated an antidote against this, and other animal poisons, that P. Baccone, who in his *Musco di piante rare*, obs. 2. has written a whole discourse upon its virtues, tells us, it is called, in Sicily, *Sanatodos*, or *All-heal*.

The third is the plant *Alyssum*, or madwort, which had its name given it by the ancients, from its great efficacy against this madness. This is of two sorts, one described by Dioscorides, a species of the *leucoium*; the other by Galen, a *manubrium* *. To these may be added garlick, agrimony, and oxylapathum.

* Vide Fab. Column. *Phytobasan*, p. 27.

DR. JAMES'S METHOD OF CURE.

Rub into the part where the wound was received, a drachm or more of mercurial ointment, as soon as possible after the bite. That made by rubbing in a mortar two parts of hog's-lard, with one of crude quicksilver, will do ; but equal parts of hog's-lard and crude quicksilver will be better, though it requires more trouble to unite them ; for great care should be taken to incorporate well the quicksilver with the lard. This should be repeated every day for a week ; but if it can be done twice a day, without salivation, it is the better. The evening of the same day let the patient take the following medicine.

Take of turpeth mineral, from three to eight grains, according to the strength of the patient, and the degree of infection received, so far as can be judged by the bite ; camphire, an equal quantity. Let this be
made

made with any conserve, as that of hips, into a bolus, or ball. This may possibly vomit, though the camphire is added to prevent it. The dose should be repeated the next evening but one ; and again after forty-eight hours interval. This cannot be done without some hazard of a salivation, especially in some constitutions. It must therefore be watched, and upon the first approach of any soreness of the mouth, or flavering, the farther use of the medicine should be deferred till that ceases, and then be re-assumed.

About two or three days after the last dose, if no accident happens as to salivation, the patient should bathe in cold water over head every day, till the day before the next full or new moon. And that day let the dose of Turpeth mineral be repeated for three times, as before ; but I think the dose may then be less, as two or three grains. And after the third dose, let the patient again bathe as before, and let this method

method be repeated for three or four succeeding periods of the moon.

This is the preservative method for the human species, but it will succeed equally with brutes, though it is impossible to specify the exact doses for them, as some are large, and others small, and consequently require larger or smaller doses. In general, for a dog of a moderate size, six or seven grains of the Turpeth mineral are sufficient.

But when any symptoms of the distemper begin to appear, somebody of skill should attend; for then the cure depends upon saturating the body, as much as possible, with mercury, without raising a salivation precipitately, or so as to injure the patient. Therefore more mercury should be rubbed in, and more frequent doses of the Turpeth mineral should be exhibited, as not a moment must be lost; when this method is pursued, no heating medicines should be given on any account. Nervous medicines, therefore, which in general ex-
cite

cite heat, are to be carefully avoided. As yet no instance has come to my knowledge of a cure performed by any of the preparations of opium, nor by musk, without mercury.

The Tonquin remedy, is in considerable reputation, and I have reason to believe, not without deserving it, in some measure. The use of it, which I would recommend is (after the preservative method has been duly pursued) to take twenty-five grains of the native cinnabar, twenty-five grains of factitious cinnabar, and fourteen grains of the best musk, in a glass of arrack, the night before several of the succeeding great periods of the moon.

DR. TISSOT'S METHOD OF CURING THE HYDROPHOBIA.

1st, The patient must be bled to a considerable quantity; and this may be repeated twice, thrice, or even a fourth time, if circumstances require it.

2dly, The

270 CANINE MADNESS.

2dly, The patient should be put, if possible, into a warm bath ; and this should be used twice a day.

3dly, He should every day receive two, or even three, emollient clysters.

4thly, The wound, and the parts adjoining to it, should be rubbed with the mercurial ointment twice a day.

5thly, The whole limb which contains the wound should be rubbed with oil, and be wrapped up in an oily flannel.

6thly, Every three hours, a dose of Cob's powder should be taken in a cup of the infusion of lime-tree, and elder flowers. This powder is made, by rubbing together in a mortar, to a very fine powder, of native and factitious cinnabar, each twenty-four grains ; of musk, sixteen grains.

7thly, The following bolus is to be given every night, and to be repeated in the morning, if the patient is not easy, washing it down with the infusion mentioned above : take one drachm of Virginia snake-root

root in powder of camphire and affafoetida, ten grains each : of opium, one grain ; and with a sufficient quantity of conserve, or rob of elder, make a bolus.

8thly, If there be a great nausea at the stomach, with a bitterness in the mouth, thirty-five or forty grains of ipecacuanha, in powder, may be taken for a vomit.

9thly, The patient's food, if he takes any, must be light ; as panada, soups made of mealy vegetables, &c.

10thly, If the patient should long continue weak, and subject to terrors, he may take half a drachm of the Peruvian bark thrice a day.

The author thinks it his duty here to set a mark of infamy upon that operation, which is called Worming a dog ; and the rather, because, the notion many people have, that no dog can go mad after it ; and of others who firmly believe, that a dog thus treated cannot bite, tho' he should he afterwards mad, may have very untoward consequences,

sequences, by lulling those of this opinion into a fatal security, whilst they are conversant with the domestic animals that have suffered this ridiculous cruelty.

Almost every town or village in England has some cobbler, farrier or huntsman, who boasts a dexterity in taking a worm from under the tongue of a puppy. They elevate the tongue, and with an awl or a penknife, or some pointed instrument, make a puncture under it, and draw out a very slender filament, which I take to be a nerve; and this contracting when recently taken away, the ideots fancy it stirs, and believe it a worm, to which it bears no manner of resemblance.

Be that as it may, I am certain from experience, that dogs thus treated run mad equally with those who have never suffered this absurd operation. There is no worm in the part, and consequently none can be taken out. All that this can do, is to prevent puppies from gnaw-
ing

ing every thing they meet with ; and for no other reason, than because it makes their mouths fore, and gives them pain when they take any thing hard in their mouths ; and this breaks them of the habit.

O F S E R P E N T S.

SERPENTS are defined to be creatures breathing by means of lungs, having only one ventricle in the heart, having no feet, and having a long body covered with scales ; to which we may add, that in cold seasons they can bear hunger a long time. The greater part of the serpent class are poisonous, and dangerous in their bite, leaving a mischievous liquor in the wound made by their teeth, which, by this means, mixing immediately with the blood, is of fatal

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con-

consequence ; though the whole creature may be eaten with safety, or even the poisonous liquor, which does this mischief in the wound, may be tasted without hurt. Notwithstanding that serpents respire by means of lungs, they do not take in and discharge their breath by such short intervals as other animals, but what they have once inspired will serve them a long time ; for as they are of a cold nature, and naturally their necessary vital warmth very small, they do not require such an eternally renewed supply of that pabulum of vital heat, as those which have more of it ; and as with us they lie half the year torpid, and half dead, their vital warmth at that time, like fire smothered under ashes, barely exists, and needs perhaps no more air, that what the creature took in at one inspiration, before its laying itself down for the season, which serves it till the life-renewing spring returns. Serpents, according to Mr. Ray, may be divided into the poisonous and the harmless ;
the

the first having long dentes exerti, with a poisonous liquor contained at their bottom, which on biting they discharge into the wound ; the others wanting these teeth and this poison. They may also be divided in regard to their generation, into the oviparous and viviparous ; but this is a less firmly founded distinction than may be supposed, since all serpents are truly and properly produced from eggs, and the only difference is, that some deposit their eggs in dunghills, and the like places, to be hatched by accidental heat ; while others retain those eggs to be hatched in their own bodies, and so bring forth living young ones, Of the first kind is the common snake, of the latter the viper. This series of animals comprehends several distinct genera ; as the Amphisbæna, Anguis, Coluber, Cenchris, and Crotalophorus.

T H E
R A T T L E S N A K E.

THE Rattle Snake is a genus of serpents, having scuta that cover the whole under surface of the body and tail, and having the extremity of the body terminated by a kind of rattle, formed of a series of unceolated articulations, which are moveable, and make a noise.

Of this serpent there are two species, the greater one with the scuta of the abdomen, in number a hundred and seventy-two; of the tail, twenty-one: and the lesser rattle snake, having of the abdomen a hundred and sixty-five; of the tail twenty-eight scuta; the larger kind is a very terrible, and at its full growth a very large serpent, growing to eight feet in length, with a proportionable thickness; the head is large, broad, depressed, and of a pale brown; the iris of the eye is red, the back is of a brown colour,

lour, with an admixture of a ruddy yellow, and variegated with a great many irregular transverse lists of a deep black; the belly is of a palish blue; the rattle is of a firm, and, as it were, of a horny substance, and brown colour, composed of a number of cells, which are articulated one within another, which articulations being very loose, the included points strike against the inner surface of the rings they are admitted into, and make that rattling noise, when the serpent vibrates or shakes its tail. This serpent is frequent in the woods of America; the bite is fatal, but it is easy to avoid it, the creature being sluggish, moving slowly, never attacking a man, unless provoked, and giving notice before it bites, by shaking its rattle.

The lesser species of this serpent grows to about seven feet in length, and in most particulars is like the former, and its bite is equally mischievous.

A very remarkable Account of a MAN bit
by a RATTLE SNAKE in AMERICA, from
the Philosophical Transactions, No. 479.

Going up a steep hill that was stony, I
being ready to fall, saved myself by my
hands, and got safe very near the top;
where either my foot slipped, or the stone
under it gave way, and brought me down
upon my knees. I laid my hand on a broad
stone to stay myself; and, I suppose, the
snake lay on the opposite side, and might be
offended by some motion of the stone, so
bit my hand in an instant, without any
warning or sight; then slid under the stones,
and sounded his rattles. I felt a sort of
chillness when I heard the sound, because
I had a constant thought, that if ever I was
bit my life was at an end. Immediately I
ran home, sucking the wound as I went,
and spitting out the poison. This kept it
easy, but my tongue and lips became stiff
and

and numb, as if they had been frozen.

The first thing applied was a fowl, which being ript open, was put on my hand alive, like a gauntlet, and then tied fast. This drew out some of the poison; for immediately the bird swell'd, grew black, and stunk. I kept my elbow bent, and my fingers turned upwards, to keep the poison from my arm.

During this time another person had got some *turmeric*; this was bruised well, tops and roots, so made into a plaister, and bound round my arm, to keep the poison in the hand: night now came on, or else, I believe, it had never gone further than the hand; for this kept the arm secure till midnight, or after: nor all this while had I much pain: my hand grew cold and numb, but did not swell very much; but now it puffed up on a sudden, and grew raging; so I slit my fingers with a razor, and this gave me some ease: I also slit my hand on the back, and cupped it, and drew out a quart or more of

ugly, poisonous, slimy stuff. But my arm swelled for all we could do: then I got it tied so fast, that the communication with the body might be stopped, that it seemed almost void of feeling; yet would it work, jump, writhe and twist like a snake in the skin, and change colours, and be spotted; and then the spots would move to and fro upon the arm, which grew painful in the bone. Thus was it kept tied two days, and all things applied that could be got or thought on. At last the

Ashes of WHITE ASH BARK and VINEGAR, made into a plaister, and laid to the bite, drew out the poison apace. My tongue and lips swelled that night, but were not very painful, occasioned only, I suppose, by sucking the wound. The swelling of my arm being more than half down, we then untied it; but, in two hours, all my right side was turned black, yet swelled but little; nor was there any pain went along with that change of colour: I bled at the mouth
soon

soon after, and so continued, with a fever, four days. The pain raged still in the arm, and the fever grew more violent; and, by turns, I was delirious for an hour; this happened three or four times, but at the end of nine days the fever abated, and I began to mend; but my hand and arm were spotted like a snake, and continued so all summer. About September or October my arm swelled, gathered, and burst; so away went the poison, spots and all, heaven be thanked, for ridding me of such a cursed adversary. But the most surprising circumstance was, to find my sleeping hours disturbed with the operation of that horrid poison, being constantly tormented with frightful dreams.

The bites of venomous snakes are frequent in our warmer American colonies, and on account of the great variety of snakes, our ignorance of the effects of their poison, which are extremely various, it is impossible to ascribe success to any one particular remedy with certainty. For some-
times

times a fatal dissolution of the fluids ensues, but most frequently a painful tumefaction and inflammation of the wounded part, with a fever, &c. is the consequence. In some instances the tumefaction subsides, without any apparent discharge; in others it is converted into an abscess, which terminates in a copious flux of ichor or pus. A cataplasm from the pulp of lemons, or limes with sea salt, applied to the wounded part, is the general remedy for venomous bites in the southern colonies; and I have often used it with success, after scarifying the wound: at other times I have successfully substituted a cataplasm from the meal of the seeds of the vegetable musk, or wild ocro plant, with olive oil; but to these I have usually adjoined oily embrocations of the adjacent parts, with the internal use of the treacle of Andromachus, decoctions of Seneca, and Virginia snake-root, or an emulsion of the seeds of the musk plant; these have hitherto been successful, though there
are

are undoubtedly poisons, against which no art can avail, such as that of the small Labarra, a snake common in Guiana.

For the Negroe Cæsar's cure for the bite of the Rattle-snake, see page 220.

THE A S P.

AETIUS observes, that there are three kind of Asps, the terrestrial, the chelidoniæ, which are found on the banks of the Nile, and the Plyades: the terrestrial are sometimes five cubits in length; but the plyades are longest, and of an ash-colour, mixed with green and gold. The terrestrial are generally of an ash-colour, but sometimes greenish.

The bite of an asp is like the prick of a needle, which is double from a male, from a female quadruple. Nothing distils from the wound, unless the animal is very angry; it is attended with a stupor, paleness, coldness of the forehead, continual yawning, twinkling of the eyes, inclination

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tion of the neck, lassitude of the body, and a profound sleep, with convulsions.

The bite of the chelidonia is immediate death ; that of the terrestrial asp kills in 3 hours ; that of the plyades produces dimness of sight, pain at the heart, swelling of the face, deafness, and at last death. The symptoms from the bite of this kind of asps come on more slow.

A N T I D O T E,

Drinking plentifully of the sharpest vinegar is said to be a cure ; and Celsus gives an instance of a boy cured by drinking of vinegar, when there was nothing else at hand.

THE

T H E

V I P E R.

THE Viper has always been so remarkable for its venom, that writers of the most remote antiquity have made it an emblem of what is hurtful and destructive.

The venomous juice is yellowish, but so inconsiderable in the quantity, that it is no more than one drop that does the execution. Mead, on examining it, says, at first sight I could discover nothing but a parcel of small salts nimbly floating in the liquor; but in a very short time the appearance was changed, and these saline particles were now shot out, as it were, into crystals of an incredible tenuity and sharpness, with something like knots here and there, from which they seemed to proceed, so that the whole texture in a manner represented a spider's web, though infinitely finer, and more minute; and yet withal so rigid were these pellucid spicula, or darts,
that

that they remained unaltered upon a glass for several months.

The symptoms which follow the bite of a viper, are a sharp pricking pain in the wounded part; a tumour, which is first red, and afterwards livid, sensibly extending itself to the neighbouring parts; a palpitation of the heart; a stupefaction of the senses; an anxiety of the præcordia; great sickness at the stomach, with bilious vomiting; a dulness of sight; sometimes pains about the navel, or the region of the liver; difficult breathing, hiccoughs, tremblings, convulsions, cold sweats, coldness of the extremities; after which death closes the scene, unless prevented by timely remedies, or the vigour of the constitution; which Hoffman thinks is generally the case in these northern climates. If the patient survives, a tumor with inflammation continues for some time. Sometimes a sanies flows from the wound, and pustules appear, like the herpes

herpes exedens : and the skin becomes yellow, as if the patient had the jaundice.

Hoffman observes, that externally in all venomous bites, it will be proper to apply such things as relax and mollify the structure of the parts that open the pores, in order to procure an exit for the virulent matter. Thus the ancients applied the parts of animals just killed to the wound ; and Celsus advises to cut a pullet in two, and apply it hot thereto ; or a kid, or a lamb, which likewise must be laid on hot. Forestus likewise recommends the same, or the breech of a living pullet.

Linderus advises to instil a drop of spirit of sulphur, or vitriol, into the wound. Internally, Celsus advises pepper, with a large draught of generous wine ; after which, he judges sweating in a warm bath to be proper. Boyle observes, that a hot iron held over the wounded part, immediately after the bite, so checks and weakens the venom, that the patient will have nothing to complain

plain of but a pain in the part of short continuance. But above all, Mead, from many experiments, recommends the fat of vipers, which being rubbed into the wounded part, renders all other remedies useless; and if that is not at hand, it appears from some late trials, that common fallad oil, rubbed warm into the part, will do as well. The Virginian Indians cure the bite of a Viper, or of a Rattle-snake, by sucking the wound (first bathing the wound, and rinsing the mouth with warm oil) giving immediately a large quantity of a decoction of the seneca rattle snake-root (which vomits plentifully) and laying to the part the same root chewed.

The viper-catchers when bitten apply presently some *axungia viperina* (fat of the viper) which proves effectual; common fallad oil rubbed into the part, as above remarked, has also been found a remedy of equal virtue.

OF THE POISONOUS JUICES EXTRACTED
FROM THE VIPER; THE INDIAN LI-
ZARD, CALLED GECCO; AND THAT
DEADLY KIND OF SERPENT AT THE
CAPE OF GOOD HOPE, CALLED BY
THE PORTUGUESE, COBRAS DE CA-
PELLO.

Pliny, in his Nat. Hist. lib. xi. c. 53, assures us, that the Scythians poisoned their arrows with the sanies of vipers mixed with human blood. The way of doing it Aristotle, in his De mirabilibus, has at large related: and the Tartars are said to use the trick to this day. After the same manner the Indians make use of the venom of the lizard, called Gecco. This creature they hang up by the tail, and by whipping exasperate it, till it discharges its virus, in which they dip their darts. Bontius, in his History of India, book v. c. 5. says, a very slight wound with these weapons is speedy death. Peter Kolben, in his Description of the Cape

of Good Hope, printed in 1719, pag. 532, informs us, that the way by which the inhabitants there, called Hottentots, kill large wild beasts, such as lions, tygers, elephants, &c. is this : they take the bladders of poison with their liquor, out of the gums of that deadly kind of serpents, called by the Portuguese Cobras de Capello ; these they dry in the sun, and grind them to powder betwixt two stones : this powder they make into a paste with the spittle or flabber of the same creature ; which paste they rub upon the points of their darts, and lay them by to dry for their use.

Other poisonous animals are the Spider, called by Mr. Boyle and Piso the Nhamdu ; in catching it great heed is to be taken, lest its poison fall into the eye, this causing a total loss of the sight.

The SCORPION, and SCOLOPENDRIA, or CENTIPES, the bite whereof, as Bontius says in his History of India ; is so painful, that it makes the patient almost mad.

The

The case is much the same with the SCORPION, whose virus in different countries is more or less dangerous, according as it is exalted by various degrees of heat: thus in Africa particularly, its effects are so dreadful, that as John Leo, in his History of Africa, lib. vi. tells us, the town of Pescara there is in a manner left desolate by the inhabitants in the summer time, by reason of the great abundance of these creatures; certain death following their sting.

As to the TARANTULA, or spider of Apulia, whether the sting be poisonous or not, I cannot determine, as many assert that it is so, and others deny the same; the antidote for its poison is said to be music.

OF THE
STING OF A BEE.

AS the structure and contrivance of most stings are nearly alike, by describing one, the rest will be understood; I shall therefore give a brief account of the sting of a bee, as discovered by the microscope.

The sting of a bee is a horny sheath or scabbard, that includes two bearded darts; this sheath ends in a sharp point, near the extremity whereof a slit opens, through which, at the time of stinging, two bearded darts are protruded beyond the end of the sheath; one whereof, being a little longer than the other, fixes its beard first; but the other instantly following, they penetrate alternately deeper and deeper, taking hold of the flesh with their hooks, till the whole sting becomes buried in the wound; and then a venomous juice is injected, thro' the

the same sheath, from a little bag at the root of the sting, which occasions an acute pain, and a swelling of the part, continuing sometimes several days. This is best prevented by enlarging the wound immediately, to procure a free discharge.

To view the sting of a bee by the microscope, cut off the end of its tail, and then, touching it with a pin or needle, it will thrust out the sting and darts, which may be snipped off with a pair of scissors, and kept for observation. Also, if you catch a bee in a leather glove, its sting will be left therein, being unable to disengage the hooks from leather: and when it is quite dead, which it will not be till after several hours, you may, by care and gentleness, extract the sting entire with its hooks. By squeezing the tail, pulling out the sting, and pressing it at the bottom, you may likewise force up the darts; but without some practice this will be rather difficult. The bag, containing the poisonous juice,

may easily be found at the bottom of the sting, and examined, being commonly pulled out with it: and by letting the bee strike its sting upon some hard body, enough of the said juice may be obtained, to put upon a slip of glass, in order to view the salts, floating therein at first, and afterwards shooting into crystals.

OF

W A S P S.

MR. Durham says, he counted, in the sting of one of our wasps, eight beards on the side of each dart, somewhat like the beards of fish-hooks; and I have observed the same number in that of a bee. When these beards are struck deep in the flesh, if the wounded person starts before the bee can disengage them, she leaves her sting behind, sticking in the wound; but if he has patience to stand quiet till she brings the hooks close down to the side of the darts, she withdraws her weapon, and the wound becomes much less painful. A wasp is not so liable as a bee to leave its sting behind, the beards of it being rather shorter, and the animal stronger and more nimble.

Heister says, the stings of wasps and bees may be cured with vinegar alone, or mixed with Venice treacle, or Armenian bole. Some commend the rubbing of the part with the pulp of an apple.

OF THE
POISON OF A TOAD.

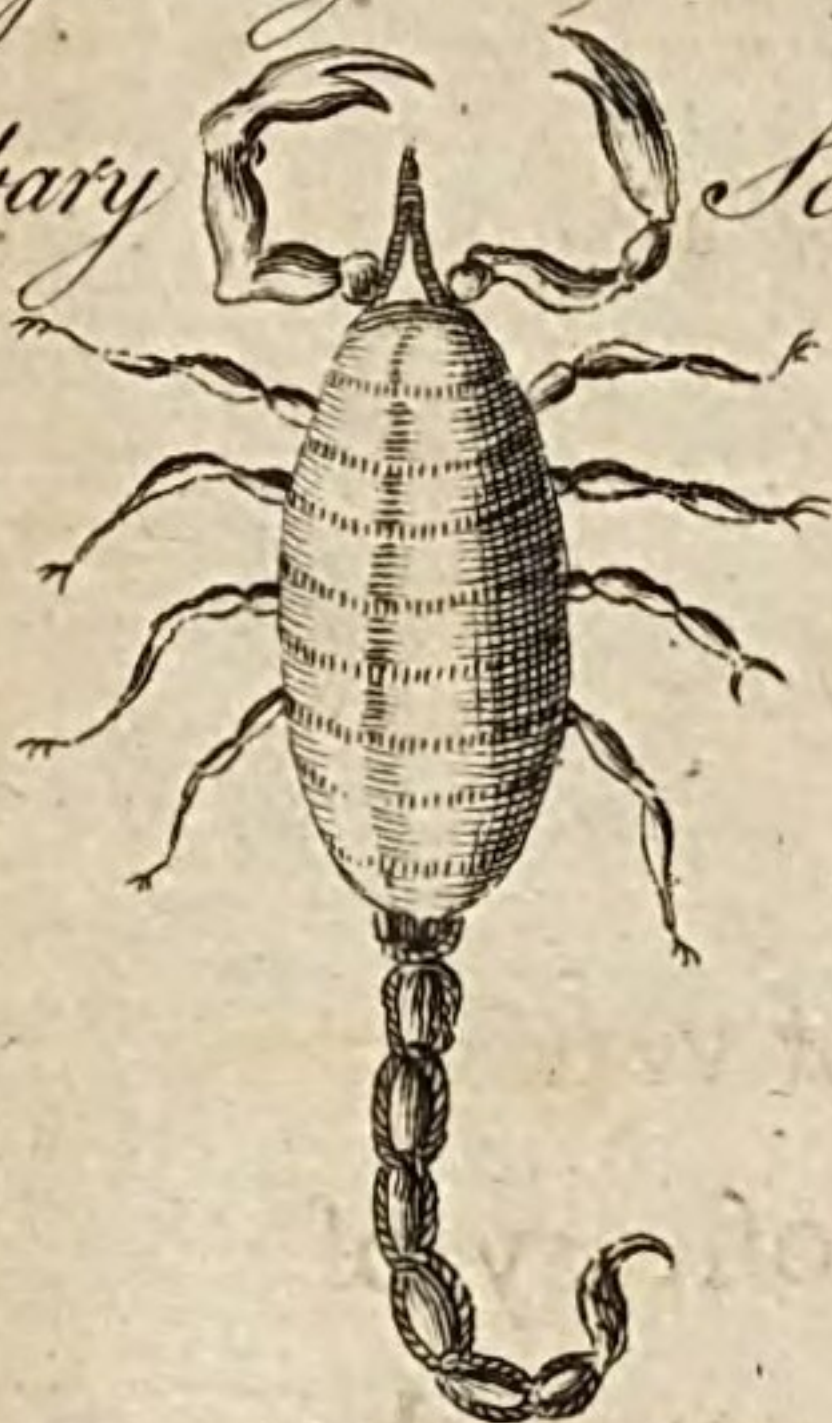
THE Toad, says Allen, is full of venom, and the very centre and repository of terrestrial poisons. If they have no teeth, yet their gums are hard and rough, and by a powerful adhesion, so operate upon the part as to instil their venom therein. The virulence of this animal seems to consist in its rage, or excrements, particularly in a sharp caustic urine, impregnated with a volatile salt; for when they are dead, they are said to be not at all venomous. They discharge their venom on herbs, by pissing, spitting, and vomiting, especially on strawberries, which they are said to be very greedy of. This is not only pernicious by getting into the body, but by being sprinkled on the skin, unless washed off immediately with urine and salt.

When

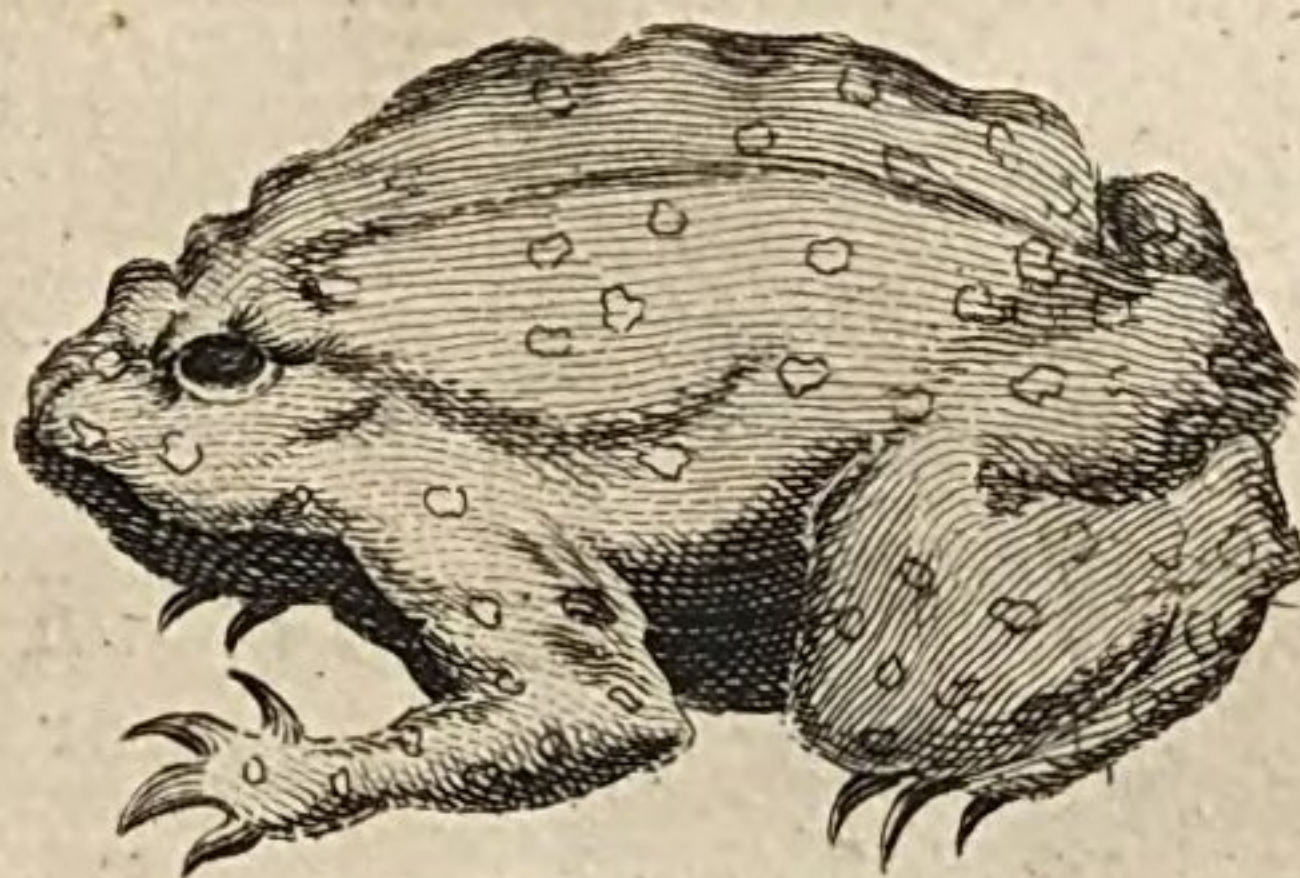
Great Yellowish-

Barbary

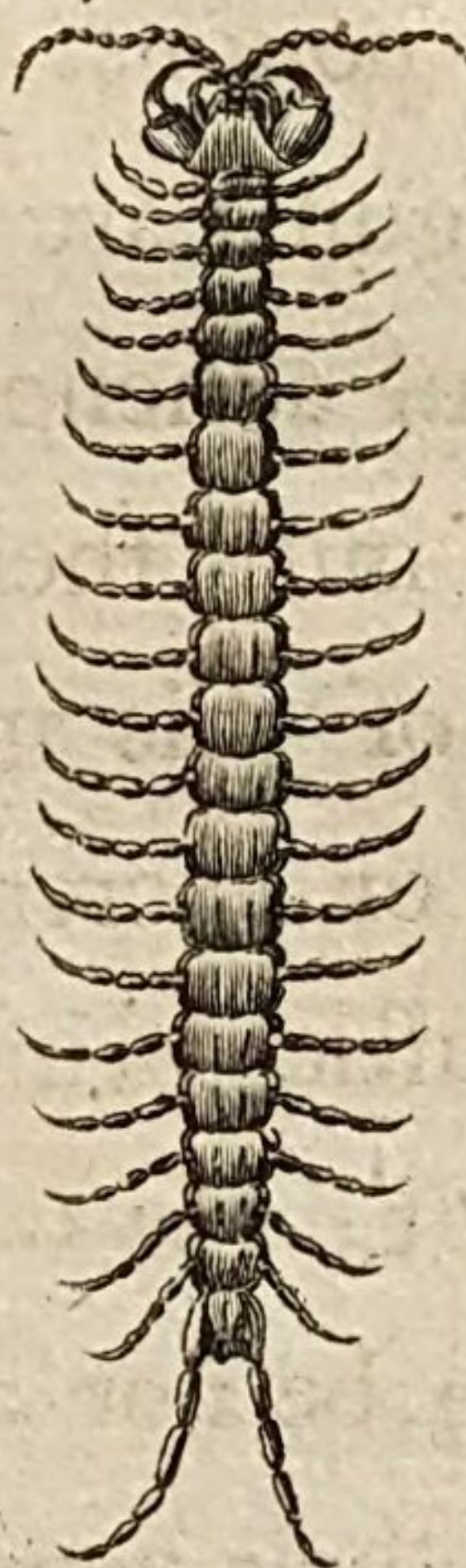
Scorpion.



Toad.



Scolopendra.



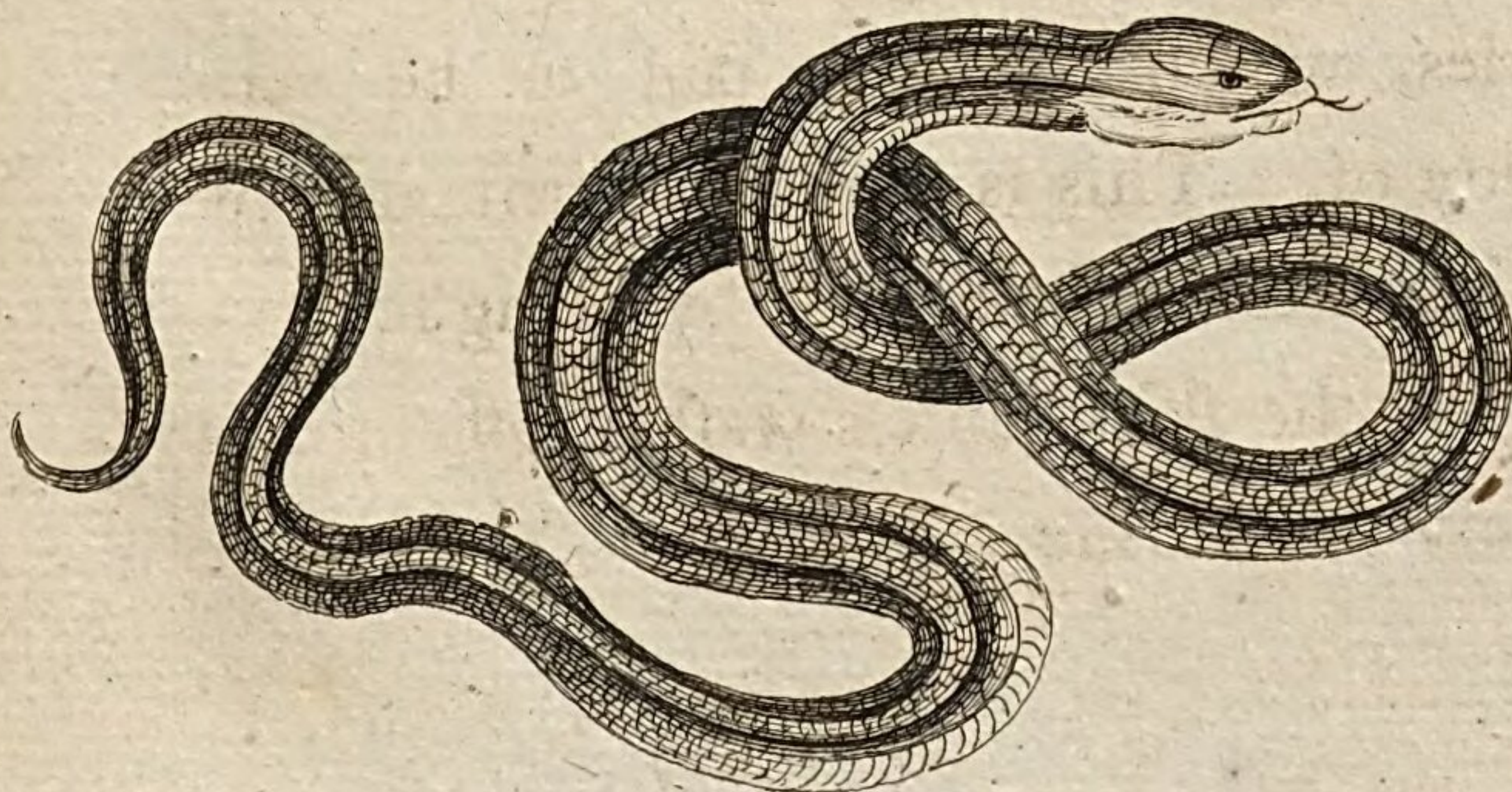
East-Indian Scorpion.



Cantharides.



Coluber.



When a person is infected, his skin turns yellow, his body swells universally, his lips and tongue grow black, and a stammering supervenes; he is seized with an asthmatic shortness of breath, vomiting, cold sweats, convulsions, fainting, and, at length, death ensues.

If the patient has swallowed the poison, he must take a vomit and a clyster, as also warm and attenuating alexiterials, as theriaca and mithridate in generous wine, bathing in salt water, and much exercise.

In all venomous bites and stings, it will be proper to relax the skin by emollient fomentations, and cataplasms of bread, milk, and oil; and sometimes with the theriaca mixed. Milk is counted an universal remedy against all poisons that kill by inflammation; more especially with the addition of oil.

CANTHARIDES.

CANTHARIDES are insects of the flying kind, and a species of shining beetle, of a golden azure, or greenish colour, and of a fetid smell. These flies are found on ash-trees, roses, elder-trees, walnut-trees, &c. and among the corn, which they corrode and destroy. Taken inwardly, they cause a furor uterinus, a priapism, diseases in the tongue, in the stomach, and in the kidneys, the bladder is inflamed and ulcerated, the person can scarcely make water, without infinite pain, and a discharge of semen and blood. The caterpillars of the fir-tree, called Buprestes, have the same effects.

Powdered Cantharides, applied to the epidermis, or scarf-skin, not only exulcerate it, but also frequently excite a heat of urine, stranguries, thirst, a fever, and sometimes a pissing of blood, and a fetid cadaverous breath. When used internally, they also excite all the above mentioned

mentioned symptoms, and are in a singular manner prejudicial to the urinary bladder.

A man having cantharides applied to his knees voided more than five pounds of blood by way of urine ; they produce also an insatiable desire of venery, tumor in the scrotum, and after the seminal matter is exhausted, blood is discharged in its place, and if not timely prevented, death follows.

Accordingly, Lanzonius Parè informs us, that a Courtezan treated a young man with a splendid supper, dressed with sauces, in which some powder of cantharides had been sprinkled. But next day her unfortunate guest, discharging blood from his anus, and his perpetually erected penis, died, in spite of all the medicines that could be exhibited for his relief.

GENERAL SYMPTOMS.

They produce an insatiable desire of venery, perpetual erections, a furor uterinus,

rinus, convulsions of the penis, involuntary discharges of the semen and bloody urine; the bladder and urethra are exulcerated, then the liver is gradually inflamed, the intestines corroded, and violent pains are excited in the hypogastrium; and these pains are succeeded by loss of reason, and death, unless the cantharides be forthwith evacuated, or the violence of their action broken.

A man having cantharides exhibited to him, was presently seized with the following symptoms: every part, from his mouth to his bladder, to him seemed to be corroded; his breath smelled like the rosin of the cedar, or some such substance; the præcordia on the right side were inflamed, he discharged his urine with difficulty, and a mixture of blood was now and then evacuated along with it. By stool he evacuated just such fæces as dysenteric patients; he loathed his food, became subject to fainting fits, was seized with so violent a vertigo,

tigo, that he dropped down, and at last lost the use of his reason in some measure.

A N T I D O T E S

This patient had oil of sweet almonds, newly expressed, and mixed with butter, exhibited with an intention to vomit him: soon after a decoction of mallows, linseed, fenugreek, and marsh-mallow-roots, was injected by way of clyster; and an emulsion of the four cold seeds was exhibited in milk; soon after water and honey, and fat broth, prepared with fowls, when the patient became better.

Acids are useful drank in proper quantities, and also applied externally: the best of these for external use is warm wine vinegar; and in the case of a priapism, the lees of generous wine. For internal use: simple oxymel and large quantities of new milk; theriaca with sorrel water to procure sleep; cordial syrups, and emulsions.

R E M A R K S

R E M A R K S

ON THE

GENERAL EFFECTS OF POISONS.

A SPITTING of blood comes in a very small quantity from the eroded vessels of the aspera arteria, and is brought up with coughing, commonly attended with itching, and a salt taste. This proceeds from a corroding caustic, contained in the stomach.

The sense of heat in the cardialgia is extreme. Its seat is the upper orifice of the stomach; sometimes the cause of it lies in the stomach itself, being a sharp, caustic matter, as in the case of poisons, and violent emetics: in the bilious cholic and dysentery it proceeds from a very sharp caustic bile.

The pain must be appeased by demulcents, oily temperant medicines, asses
milk,

milk, or a saturated infusion of chamomile flowers with cream, as also by absorbent powders.

In diseases of the head, such as the vertigo, phrenzy, madness, melancholy, or epilepsy, the urine is always thin and light. It is likewise the same in the more grievous affections of the nerves, from poison, or worms. Thus lighted charcoal, in a close place, fills the air with sulphureous particles, which sometimes kill the strongest persons.

ON THE PULSE.

Poisons render the pulse small, contracted, and hard.

ON THE NERVOUS PARTS.

Caustic poisonous matter conveyed to the nervous fibrils of the wounded skin, by the bite of a viper, scorpion, mad dog, or by an instrument moistened with the juice of white hellebore, oil of tobacco, or an
arsenical

arsenical liniment, will throw the nervous system into commotions and spastic strictures. Hence a fever, syncope, cold sweat, paleness, nausea, vomiting, yellowness of the skin, convulsions, alienation of the mind, obstinate costiveness, suppression of urine, high anxiety, and difficulty of breathing.

And here specifics or antidotes are necessary, if possible, to subdue the active particles of the poison. The sting of a Wasp, in a membranous part, will sometimes produce terrible symptoms.

GENERAL SYMPTOMS.

The stomach has the most intimate sympathy with all the rest of the parts ; for let the nerves be hurt any where, the stomach always suffers. Even a strong blow on the pit of the stomach has been fatal. Nothing makes this more evident, than the taking of arsenic, or any corrosive preparations of mercury, or antimony ; *cicuta aquatica* ;
can-

cantharides, or their tincture, and fungi of various kinds, as also drastic purges, which alone cause the strongest spastic contractions of the whole nervous system. Hence a cardialgia, reaching to vomit, hiccough, anxiety of the præcordia, difficulty of breathing, constriction of the diaphragm, dryness of the tongue and fauces, unquenchable thirst, costiveness, retention of wind, a griping looseness, a perpetual stimulus to urine, coldness of the extremities, cold sweats, an hippocratic countenance, a trembling of the limbs, an intermitting pulse, a delirium, fainting, convulsions, and epilepsy ; which are the general symptoms of poison, and arise from the erosion of the coats of the stomach.

A fever sometimes attends those that are poisoned, owing to a poisonous, subtle, caustic matter, either bred within the body, or received by infection ; a stoppage of perspiration ; a suppression of critical sweats ; eruptions driven back ; an abundance of purulent ulcerous matter adhering to various

X parts.

parts. In this case all acids are highly praised, such as Seville oranges, lemons, vinegar, &c. which resist poison and putrefaction, and prevent the dissolution of the blood.

OF THE INFLAMMATION OF THE STOMACH.

An inflammation of the stomach, which arises from drastic purges, sharp emetics, or caustic poisons, kills quickly, without speedy assistance.

When occasioned by a caustic, septic, arsenical poison, or by a strong emetic or cathartic, or by metallic remedies badly prepared, oily fat things are proper, as new milk, cream, oil of sweet almonds, or olive oil, with honey, and honey of roses, which are cleansing; and decoctions of comfrey-root, or new milk, which are healing, taken often and plentifully.

OF AN INFLAMMATION OF THE FAUCES.

Some caustic poisons affect the throat more than other parts, cause an inflammation of the fauces, with a burning pain,
tumour

tumour and redness, and a difficulty in breathing and swallowing. Thus white Hellebore affects the fauces, and brings on a strangulation. The same ensues from the solanum furiosum, and the bite of a mad dog. The fumes of arsenicals and mercurials, as also the vapours of mineral spirits, have the same effects. In the Philosophical Transactions, the jelly of black currants, swallowed down leisurely in small quantities, is asserted to be a specific for a quinsy [or inflammation of the fauces] and in the winter, a decoction of the leaves or bark in milk, when the jelly cannot be had, used as a gargle, is said to cure all inflammatory distempers of the throat.

OF VOMITING.

Vomiting is caused by poisons, as the inflammation of the intestines, &c. In this case, nothing is better at the beginning, than drinking large quantities of milk and fat oily things, to sheath the acrimony of the poison, and bring them up by vomiting.

SYMPTOMS ATTENDING MINERAL POISONS.

Anus, a mortification of the,	—	Arsenic.
Anxiety, inexpressibly cruel,	—	ditto
Dejection, with sighing great,		ditto.
Convulsive cholic, or dry belly-ach,		Lead.
Costiveness, obstinate, with cholicky pains,	}	Fumes of Lead.
Dryness and roughness of the tongue, fauces and gullet,	}	Arsenic.
Heart, palpitation of,	—	ditto.
Hiccough, painful,	—	ditto.
Inquietude, extreme and cholic,		Fumes of Lead.
Intestines cruelly tormented, convulsed, and their coats mortified,	}	Arsenic.
— Pain intolerable in,	—	Fumes of Lead.
Joints, contraction of,	—	ditto.
Nausea, with reaching and inclination to vomit,	}	ditto.
Navel drawn inwards,	—	ditto.
Pain, in the intestines, intolerable,		ditto.
Pain in the intestines, cruel, and convulsions, therein,	}	Arsenic.
Palpitation of the heart,	—	ditto.
Sighing, great,	—	ditto.
Stomach, heat and pain in the, most violent,	}	ditto.
Thirst, unquenchable,	—	ditto.
Ulcers of the fauces, and their salival glands,	}	Mercury.
Vomiting, enormous, with most cruel gripings,	}	Glass of Antimony.
Ditto.	—	{ Verdigrease, or the poison of copper.
Voice, a faintness, or loss of,	—	Arsenic.

S Y M P.

SYMPTOMS ATTENDING VEGETABLE

P O I S O N S.

Abdomen, swelling of the, —	Hemlock, &c.
Body, strange shaking, writhing and distorting of the, }	ditto.
Epilepsy, — }	Eating poison- ous vegetables.
Giddiness of the head, —	Poison by ditto.
Hiccough, supervenes to a painful,	Hemlock.
Madness, stupidity, &c. — }	By Datura, ber- ries of deadly night-shade, and roots of cicutæ terrestris.
Mouth, a flux of green froth from the, after death, — }	ditto.
Reaching to vomit, fruitless,	Hemlock, &c.
Senses, abolition or suspension of,	ditto.
Sleepiness, continual, with a torpor,	Opium.
Spasms, universal, —	Hemlock, &c.
Stomach, pain in, with a sense of pricking, and heat, turn- ing to a mortification, }	ditto.
Stomach, a swelling, like one's fist at the pit of, — }	ditto.
Stupidity, — — —	ditto.
Vertigo, — — —	ditto.

SYMPTOMS ATTENDING AMERICAN AND
INDIAN POISONS, &c.

Anxiety.

Appetite, want of, or weak,

Breathing, difficulty of,

Breast, a pain of,

Burning, and violent pains of the viscera, above
and below the navel,

Body, pains all over the,

Blood, an evacuation of,

Contractions of the Nerves,

Cardialgia, and reaching to vomit,

Coldness of the extremities,

Cold sweats,

Countenance, an hippocratic,

Convulsions,

Coats of the stomach ulcerated,

Costiveness, obstinate,

Death, immediate, or protracted for a longer time,
according to the dose,

Dryness of the tongue, &c.

Delirium,

Erosion of the coats of the stomach,

Fever, an inward,

Face pale, yellow, and swelled,

Feebleness, universal,

Fauces, dryness of,

Fainting,

Inflammation of the throat, fauces, and gullet,

Inflammation of the stomach,

Hair falling off of the.

Hiccup,

Hiccough,
 Load at the pit of the stomach,
 Limbs, weakness of the,
 Limbs, trembling of the,
 Mind, alienation of the,
 Navel, great pains above and below it.
 Nausea, or inclination to vomit,
 Pain violent in the breast, above and below the na-
 vel, in the viscera, and over the whole body,
 Pulse, intermitting,
 Paleness,
 Restlessness at night,
 Skin, peeling of the,
 Slimy stools,
 Sweats, profuse,
 Spittle, a flux of, and a copperish taste in the mouth,
 Throat inflamed,
 Urine, difficulty in making,
 Vomiting and inclination thereto,
 Weakness in the limbs.

SYMPTOMS ATTENDING ANIMAL POISONS.

Bite the by-standers, a great in- clination to,	}	Hydrophobia, or dread of water.
Body, a lassitude or weariness of,		Bite of an asp.
Body, lassitude, heaviness and restlessness of,	}	Bite of a mad dog.
Breathing, short and asthmatic,		Bite of a toad.
Coldness of the extremities,		Bite of a viper.
Coldness of the forehead,		Bite of an asp.
Convulsions, violent,	—	Poison of a toad.
Delirium, raging,	— —	Bite of a mad dog.
Dread of water,	—	Bite of a mad dog.
Eyes, twinkling,	— —	Bite of an asp.
Fainting,	— —	Poison of a toad.
Fainting, remarkable,	—	Bite of a viper.
Fever, an acute, continual,		Bite of a mad dog.
Jaundice, universal,	—	Bite of a viper.
Heat increased,	— —	ditto.
Heart, palpitation of,	—	ditto.
Hiccough, a painful,	—	ditto.
Horror, at the sight of liquids, bright, or pellucid things,	}	Bite of a mad dog.
Hydrophobia, or dread of water,		ditto.
Lips, black and swelled,	—	Poison of a toad.
Liquids, a trembling, shaking, and abhorrence at the sight of,	}	Bite of a mad dog.
Liver, pain sometimes fixed a- bout the region of,	}	Bite of a viper.
Music and dancing, delight in, with many antic gestures,	}	Bite of a tarantula.
Navel, pains sharp and pricking sometimes about the,	}	Bite of a viper.
Pain in the region of the liver, fixed sometimes,	}	ditto.
Pain about the navel, sharp and pricking,	}	ditto.

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Pain in the part bitten, and afterwards ascending towards the throat, — — — — —	Bite of a mad dog.
Pain in the part bitten, sharp and twitching, — — — — —	Bite of a viper.
Palpitation of the heart, —	ditto.
Præcordia, anxiety of the, —	ditto.
Præcordia, a prodigious straitness of, — — — — —	Bite of a mad dog.
Priapism, — — — — —	ditto.
Pulse and breathing intermitting, —	ditto.
Pulse, intermitting sometimes; quick, weak, — — — — —	Bite of a viper.
Sadness, sighing, and love of solitude, — — — — —	Precedes the hydrophobia.
Senses, a stupor, or stupefaction of, —	Bite of a viper.
Shaking and trembling at the sight of water, or any thing bright and pellucid, — — — — —	Bite of a mad dog.
Skin, yellow, — — — — —	Poison of a toad.
Sleep, profound, with convulsions, —	Bite of an asp.
Sleep, unquiet and troubled, with terrible dreams, — — — — —	Precedesor accompanies the hydrophobia,
Solitude, a fondness of, precedes, —	ditto.
Speech, a stammering in, — — — — —	Poison of a toad.
Spit at the by-standers, an involuntary inclination to, — — — — —	Hydrophobia.
Stomach, sickness great of, with bilious vomiting, — — — — —	Cantharides taken inwardly.
Strangury, — — — — —	ditto.
Sweat, cold, — — — — —	Bite of a mad dog.
ditto, — — — — —	Poison of a toad.
Sweat, exceeding cold, — — — — —	Sting of a scorpion
Swelling, an universal, — — — — —	Poison of a toad.
Teeth, gnashing of the, — — — — —	Bite of a mad dog.
	Tongue,

Tongue, black, — — —	Poison of a toad.
Thoughts, a confused series of wild and extravagant, }	ditto.
Tongue rough and hanging out,	ditto.
Urine, difficulty of, with a fil- thy discharge, — — }	Cantharides, &c.
Urine, bloody, — — —	ditto.
Voice, hoarse, — — —	Bite of a mad dog.
Vomiting, of a dark bilious viscid matter, or poraceous bile, }	ditto.
Watchings, constant, — —	Hydrophobia.
Water, starting at the sight of, with a dread of, and wild looks, }	ditto.
Yawning, continual, — —	Bite of an asp.

APPENDIX.

A P P E N D I X.

A N

A N A L Y S I S O F C O P P E R,

AND ITS P O I S O N.

COPPER constitutes a distinct genus of metals, being next to iron in specific gravity, but lighter than gold, silver, or lead. Copper is sometimes found native, and malleable, both in small and slender fibres, and also in globular and irregular masses. However, it is most frequently found in the state of an ore; the ore in this state, as well as lead, is a natural concrete of metals or semi-metals, mixed with sulphur, or arsenic, or both together, and that in a great degree. In the state of ore, copper is sometimes blended with strata of stone, where it discovers itself in blue or green efflorescences. The green and blue ochres also are ores of copper, and the pyrites

rites and marcasites frequently contain large quantities of this metal; for in Germany, they extract sulphur and vitriol from the silver marcasite, which two substances are always contained in it; and besides these, usually a quantity of arsenic. There is also a rich kind of copper-ore, of a reddish-grey colour; and another of a dusky purple, or blackish colour. But besides all these, there are two other appearances of copper-ore, known by the names of Lapis Lazuli, and the Turquoise stone. The first, being one of the ores of copper, the basis of which consists in a crystalline matter, coloured with that elegant blue which copper gives to all alkaline liquors. The tincture of this proves a very violent purgative and emetic, owing to the copper it contains. The turquoise also is a true and genuine ore of copper. That kind, which we usually distinguish by the name of the turquoise of the old rock, and which Pliny and the ancients called Callais, is a true and genuine copper-

copper-ore, and is exactly of the same kind in regard to this metal, that the hæmatites is to iron; it is found in the perpendicular fissures of the strata of stone, which contain copper adhering to their sides in form of a crust, and rising into botryoide efflorescences, which sometimes stand single, and are in bigness from the size of a pea to that of a walnut; but sometimes happening to be placed close to one another, they join and form flat crusts or masses, extending, in the manner of the crusts of the hæmatites, to three, four, or more inches in breadth; in these the prominent part of every tubercle appearing on the surface, the whole seems a conjunction of semicircular bodies of a fine blue colour, joined by an intermediate substance of the same nature. This kind of turquoise is of a very close texture and glossy surface, but very soft, and when broken, shews the same crustated and striated texture as the hæmatites; only that the striæ are usually finer, and the plates better joined.

joined. It ferments with aqua fortis, and may be in great part dissolved by it; and on calcination loses all its colour, and becomes of a dirty white. This is produced in Persia, and some other parts of the east. The Germans also have a botryoide copper-ore in some of their mines; but it is green, and much softer than the true turquoise of this species. There is another turquoise, which is usually worn and made up by the jewellers, which is nothing more than the teeth or bones of animals, which have lain in the way of the effluvia of copper, and by this means have acquired veins and streaks of a deep blue, which, on the whole being slightly calcined, diffuse themselves through all the substance, and gives it the fine pale blue so much admired in this kind of turquoises. If the fire that diffuses this colour be a little too strong, it wholly discharges it, and leaves in place of the turquoise only a white bone. All these prove most powerful emetics, and are highly

ly

ly dangerous. In order to discover whether pyrites contain any copper, let it be calcined in an open fire, and a solution made, by pouring upon it a quantity of warm water; into this solution let iron plates, perfectly clean and free from grease, be immersed; and if the pyrites contain any copper, it will stick to these iron plates, in form of a fine yellow powder. As to the method of obtaining copper from the ore, this last being previously washed and powdered, is smelted by means of the black flux, and the metal is found at the bottom of the vessel when cold, in the form of a solid, malleable mass; which may be farther refined, by repeating the operation.

Most physicians condemn the internal use of copper in any form; as all its preparations are poisonous, in a higher or lesser degree. But as it acts as a powerful and instant emetic, there are some who strongly recommend it in cases of other poisons, where vomits are highly necessary to throw
the

the poison up ; and say, that nothing is more efficacious. It frequently happens that even our food, by standing long in copper vessels, acquires an emetic quality, which has very bad effects, as will appear in the sequel.

The preparations of copper are various ; but verdigrease, the principal one, will serve to shew the power that acids have on this metal ; we shall therefore only give the method of preparing verdigrease : that substance is no other than copper, dissolved by a mild acid into the form of an *æru*go, or rust.

The process by which verdigrease is made is this : after pressing the grapes for wine, the husks, stones, and other refuse, are laid to be dried in the sun ; they are then moistened with the lees of the strongest wine that can be had, and laid together in vessels till they begin to ferment ; after nine or ten days the matter is pressed, and worked into balls between the hands, and laid in an orderly manner over the bottom of an earthen vessel,

vessel, with as much wine as will half cover them. The vessels are then covered with a loose lid, and set in a cellar, where the balls are left in the wine about fifteen hours, a person turning them four or five times in that space, in order to make the wine soak perfectly thro' them; after this, some wooden bars are placed across the vessel, about half an inch above the surface of the wine, and the balls are laid out of the wine upon these; the vessels are then shut up, and the whole left in this state for ten days or more: at the end of this time the balls emit a very penetrating scent, and are fit for dissolving copper.

They are now to be broke to pieces, and the outside mixed with the internal part, which is moister; they are then laid with thin plates of copper, stratum super stratum, in the same vessels upon the bars, and the whole is left for a week or a fortnight, at the end of which time the plates are found covered with verdigrease, which is not to be

Y

taken

taken off immediately; but they are wrapped up in cloths wetted in wine, and laid by a week or more, and then the ærugo, or verdigrease, is taken off for use. This rust of copper is seldom used internally, nor ought it, unless in the most desperate cases, where an instantaneous vomiting is necessary, as has been already mentioned. Externally, it is a most excellent detergent and deficcative, it eats away fungous flesh in ulcers, and is one of the best remedies yet known for venereal and fungous ulcers, when mixed in a due proportion with yellow basilicon.

From the powerful effects of vinegar, which corrodes this metal, the utmost caution is requir'd; and also to see that no liquids are let to stand in copper vessels. Fermented liquors from the acid particles that they contain, are observed to corrode copper, if suffered to remain in them any length of time. Therefore in brewhouses, persons ought to be cautious how they let the liquor
remain

remain till cold, as in this case the volatile parts of the copper impregnate it with the poisonous qualities of the metal : whence in all brewhouses, the cleaning the copper ought to be the first thing attended to. This caution *Geo. Thwaites*, Esq; an eminent brewer in Dublin, daily saw himself duly executed, and rewarded his people constantly for keeping the copper vessels clean scowered, which was one principal reason of his not having any returns of ale made during a very hot summer, although other brewers had great numbers of barrels of ale returned unfit for any other use, except that of being sent to the makers of white lead. To this gentleman's close attention in having his copper vessels immediately cleaned, and the wort not let to remain in the vessels longer than was absolutely necessary, to prevent any impregnation of this kind, it was owing that his drink kept longer sweet, and did not possess the emetic quality too often found in fermented liquors of this

kind. When the copper is not carefully cleaned before it be used, the wort will absolutely dissolve the rust of it; also if any of the wort, be the quantity ever so small, is left in the boiler, it becomes acid, and then it shews its powerful qualities, by corroding the copper, the consequence of which is, that it impregnates the liquor afterwards put into the vessel with poisonous qualities, which cause the aforementioned symptoms. From this it shews how improper it may be found to have brass cocks remain in those casks which contain wine, vinegar, or malt liquors; and I think there ought to be other methods found to draw off liquors; thus let them run from a vent, or, as the common way is, by a wooden spigot and faucet, it being safe, and will prevent any accident that may happen this way from the use of brass or copper cocks; or some compound metal of tin and bismuth, which is not affected by the vegetable acid, might answer the purpose.

This

This metal is dissolved or rendered saline by all acids; and from the above observations in the making of verdigrease, the vegetable vinous acid, though its action be slow, yet dissolves copper in the greatest quantity of any, the nitrous acid excepted. Alkaline salts, either fixed or volatile, dissolve it, the first in greater quantity, but the latter is the more expeditious and acrimonious. It is likewise corroded or dissolved by all neutral salts, both of an acid and alkaline nature.

Copper tea-kettles, &c. when long used, highly impregnate the water, and that roughness, which is so often thought to proceed from the juice of the tea, is nothing more than a corrosive quality or pungency, caused by the solution of those poisonous parts of the copper, and these being changed by the action of fire into a saline state, whereby the most poisonous part incorporates with the water; and to this is owing the whole chain of nervous com-

plaints, as is evident, from no such accident attending water used for tea, when boiled in an iron or tin tea-kettle. This is further confirmed, as I have known a lady subject to a lowness of spirits, attended with faintings, loss of appetite, and other nervous complaints, who, on my requesting of her to make use of an iron or tin tea-kettle in future, which she did, was thereby freed from all her former disorders. I have found tea made with water boiled in an iron or tin tea-kettle, produce effects which many will perhaps disbelieve, but on trial will be found to be true, viz. such tea taken in a moderate quantity, acts as a gentle astringent and corroborative: it strengthens the stomach and bowels, and is good against nausea, indigestions, and diarrhæas, and also acts as a diuretic and diaphoretic.

The air reduces copper into a saline state, and vessels that are exposed thereto, if not kept clean, will contract a blue or green rust on their surface, which is highly poisonous;

sonous; and it is to be observed, that the casters of old lead, which has been long subject to the action of the air, is impregnated with a saline quality adhering to it, or uniting with it; whence the workers in it find disagreeable effects, which they do not experience from the working of new lead.

THE EFFECTS OF COPPER.

In whatever state taken internally in the body, it acts as a virulent emetic and cathartic, and if none of these evacuations happen it affects the nervous system, causing convulsions, delirium, stupor and head-ach, and sometimes a mania, with symptoms of an inflammation of the brain, of its membranes, and also excite violent pains; and if the substance be not quickly discharged, inflammation of the stomach, and violent vomiting and purging, difficulty of breathing, spasmodic bowels, contraction

of the limbs, and death finally closes the scene, if the quantity of the poison be large.

The remedies proper in such cases are, first, to take a great quantity of milk, oil, or melted fresh butter ; then to drink warm water till the patient vomits plentifully. Clysters made with oil, butter, or fat broths, are likewise proper, and lastly strengthening cordials, with a milk diet.

I have several times remarked (but lest I should be led astray by my own opinion I have questioned cooks about this matter) that vegetables, more particularly spinage, highly partakes of the quality of the copper, when boiled in such a vessel, as it occasions a sense of roughness on the tongue, if eaten without butter ; and also cabbage blackens the water which it is boiled in, and if let to stand till cold, causes an intolerable stench, and at last the water changes to a muddy green colour, which will also corrode the vessel. Hence it is apparent, that it is highly necessary not to let any
thing

thing designed for use stand to cool, or let any thing which turns acid, as milk, to remain long in vessels of copper or brass, as such things will infallibly corrode the metal.

Common sea salt powerfully corrodes copper, which is one great reason, why salt meat ought never to be dressed in vessels of copper, as the consequence may prove fatal. Butter melted in a copper sauce-pan becomes also highly impregnated with the poison, owing to the salt which is in the butter; and it is remarkable, that nothing contracts a taste from a copper vessel sooner than melted butter; as sweet oil suffers no such change, it is highly probable, that it is owing either to the action of the salt, or to the butter being inclined to rancidity: all earthy salts corrode copper very powerfully, especially when assisted by heat.

After what has been here mentioned, it may not be improper to offer some particular

ticular remarks of my own on copper and lead.

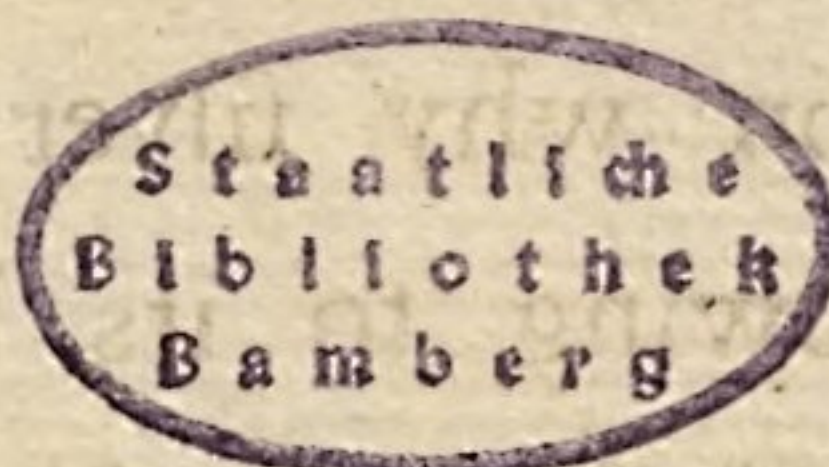
REMARKS.

There is an oily effence in copper and lead, which by the air or fire they part with ; when this oily principle is destroyed, there remains an alkaline salt, which then begins to corrode and consume vessels made of those metals, and finally makes its way thro' them. This observation I find to be confirmed by the less perfect metals, and semi-metals, melting more easily by the addition of salts.

This is a convincing proof in respect to native gold, which is wholly incapable of rust, and which does not suffer the accidents, which are common to other metals, being free from the penetrating sulphurs, &c. which reduce other metals to ores. And the reason why silver is sometimes corroded, is owing to its being impregnated with these bodies, from which it is
 extracted,

extracted, as among the ores of copper, the ore of lead, of cobalt, antimony, &c. It is also proper to observe, that silver is purified by means of lead; for in melting silver, copper easily mixes with it, which makes it acquire a hardness, which renders it more fit for utensils, than in its pure natural state. It is well known, that lead contains a great part mercury, as also does copper, but then the copper does not appear so much as it does in the lead.

E I N I S.



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Prestwich, John

Prestwich's Dissertation on mineral, animal, & vegetable poisons containing a description of poisons in general, their manner of action, effects on the human body, and respective antidotes : with experiments and remarks on noxious exhalations from earth, air and water : together with several extraordinary cases, and elegant engravings of the principal

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